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Firm installs SDN, waits on Tariff 12

By Bob Wallace
Senior Editor

FORT WAYNE, Ind. — Lincoln National Corp. has contracted with AT&T for one of the nation's largest Software-Defined Networks (SDN) after evaluating design proposals from the carrier every quarter for almost three years.

The contract, which covers 10% of the firm's voice traffic, is part of a larger effort to cut costs. The company is now looking at new options for the bulk of its long-distance business and will consider a Tariff 12 custom network deal from AT&T, according to John Chiazza, a second vice-president for Lincoln National.

"All the rest of our business is up for grabs to the carrier that can provide us the biggest savings and the highest level of service and support," Chiazza said.

AT&T currently handles 80% of Lincoln National's voice traffic, while the remainder is split between MCI Communications Corp. and US Sprint Communications Co.

Lincoln National's 300-site SDN, slated to be cut over by year end, will save the diversified financial services company $1.2 million a year and reduce the per-minute call cost by almost 15%.

The SDN will be used to link widely dispersed Lincoln Nation-

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FEATURE

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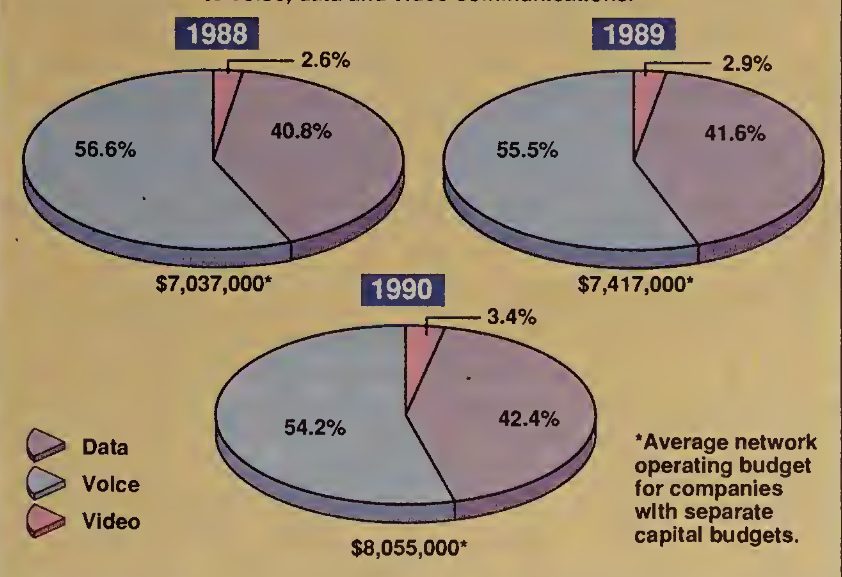
Average budget allocations

Amount of network operating budget allocated to voice, data and video communications.



*Average network operating budget for companies with separate capital budgets.

GRAPHIC BY SUSAN SLATER

SOURCE: TFS, INC., WESTFORD, MASS.

Annual budget survey predicts 9% growth in '90

By Barry Gilbert
Special to Network World

"A billion here, a billion there, and pretty soon you're talking real money," the late Sen. Everett Dirksen (D-Ill.) once said in reference to the congressional budget-setting process.

Well, we're certainly talking about real money here.

This is budget season, and network managers nationwide are trying to determine how to justify and allocate their 1990 budget requests.

For all the common wisdom on the value of communications, the mission-critical nature of networks and the competitive advantage one can gain from information systems technology, it's never easy to determine exactly how much *should* be spent on communications.

To shed some light on how users are making budget decisions, *Network World* commissioned a detailed budget study conducted this summer by the COMM/SURV division of TFS, Inc., a Westford, Mass.-based consulting and research firm.

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US Sprint trumpets ISDN rollout plans

Will offer PRI service, five advanced features on nationwide basis beginning in first quarter of 1990.

By Anita Taff
Washington Bureau Chief

KANSAS CITY, Mo. — US Sprint Communications Co. last week announced it will roll out Integrated Services Digital Network capabilities on a nationwide basis during the first quarter of 1990.

The carrier said it will provide ISDN Primary Rate Interface service and five ISDN features: dynamic access to switched 56K and 64K bit/sec services; dynamic access to Telenet Communications Corp.'s packet-switching network; dynamic channel allocation; automatic number identification (ANI); and a feature dubbed VPN PBX Interworking, which lets multiple private branch exchanges share call information and support a common set of features across a virtual private network.

Analysts said the ISDN services are a competitive necessity for US Sprint in its battle for large business users.

"In order for US Sprint to win those kind of customers, they must offer capabilities like this," said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Manchester, Conn.

AT&T announced ISDN Primary Rate Interface service, along with dynamic channel allocation and ANI features, in April 1988. In May, MCI Communications Corp. laid out its ISDN strategy.

The carrier said it would offer a set of ISDN-like services provided over users' current facilities by year end. It also said it would introduce true ISDN service in the

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Net management group close to winning holdouts, page 9.

User hustles to salvage DNS network

By Jim Brown
Senior Editor

MILWAUKEE — One of the first users of Northern Telecom, Inc.'s Meridian Data Networking System (DNS) last week said it will continue building a nationwide private network based on DNS despite Northern Telecom's decision to scrap the product.

Northwestern Mutual Life Insurance Co., which purchased more than 100 DNS nodes, said it will move ahead with its DNS project until it can draft a new networking strategy. The company had hoped to use DNS nodes linked by a wide-area net to support local networks in agent offices, but Northern Telecom never delivered DNS' local net capabilities, and it isn't clear whether it will.

Northwestern Mutual Life had outfitted about half of its offices with DNS nodes before the product was withdrawn from market ("Northern Telecom gives up on costly data net system," *NW,*

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NETLINE

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MICHIGAN UNIVERSITIES look to AT&T to build a shared virtual private network. Page 2.

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DESPERATELY SEEKING ISDN, an N.C. State staffer pushes for testing lab. Page 4.

GROCER TAKES STOCK of EDI standards to improve inventory management. Page 5.

JUST HOW SAFE is the public switched network? Opinions vary widely. Page 26.

NEWSPAPER

As SNA milestone looms, IBM shares future vision

By Paul Desmond
Senior Writer

RESEARCH TRIANGLE PARK, N.C. — On the eve of SNA's 15th birthday, IBM's top network architects discussed the evolution of the network architecture and the challenges ahead, including support for OSI, true peer-to-peer networking and enhanced net management.

IBM said it is examining ways to functionally evolve Systems Network Architecture to support dynamic routing and the dynamic addition of nodes. The company will also try to improve SNA as a means for linking local networks.

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IBM's John Hunter

AT&T to offer virtual net for Michigan college group

AT&T's VPN, which will be filed under Tariff 16, is expected to let schools reap volume discounts.

By Gail Runnoe
Washington Correspondent

WASHINGTON, D.C. — AT&T last week said it will provide a customized virtual private network (VPN) that will enable Michigan colleges to pool voice and data traffic to achieve greater pricing discounts.

Under the terms of the contract, which AT&T will file as a Tariff 16 deal, all universities and colleges belonging to the Michigan Collegiate Telecommunications Association (MCTA) can elect to participate in the Michigan Academic and Governmental Network (MAGNET). AT&T says the 97 MCTA members could earn volume discounts that are generally only available to large corporate users.

MCTA is the first group to take advantage of a new service arrangement that AT&T plans to offer to universities and state governments across the country ("AT&T preps service for states, schools," *NW*, Aug. 28).

Because Tariff 16 applies strictly to governmental agencies, AT&T said it is working with MCTA to bring private colleges onto MAGNET. An AT&T spokeswoman said a billing arrangement in which MCTA acts as a reseller of the network service might be worked out.

AT&T is expected to file its MAGNET proposal with the Federal Communications Commission later this week. At that point, details about the service features, rates and volume discounts will be released.

Roxanna Block, MCTA vice-president and director of telecommunications at the University of Michigan in Ann Arbor, said MCTA examined proposals from US Sprint Communications Co. and MCI Communications Corp. in addition to the AT&T plan. US Sprint pitched its State Interconnected Government Network, an offering introduced about a year ago that allows state governments and universities to share a VPN.

Block would not discuss details of AT&T's offering but said "AT&T offered a more attractive package" than the other carriers.

She said that if the FCC approves AT&T's plan, the University of Michigan will join MAGNET. She declined to detail how the university could benefit from MAGNET.

Robert Bursick, director of telecommunications at Wayne

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T-1 mux vendors race to gain stronghold in T-3 mart

Vendors' user base seen as key to T-3 success.

By Bob Brown
Senior Editor

Timeplex, Inc.'s acquisition of Broadband Telesystems Corp. last month has heightened the race among leading T-1 equipment makers to gain an edge in the emerging T-3 market.

Timeplex is only one of a growing number of T-1 vendors that has either acquired T-3 technology or announced T-3 products or intentions in the past year.

The vendors with the best chance to capitalize on T-3 will be those with a large installed base of high-end T-1 products, according to analysts. It will also be important for vendors to integrate control of T-3 products into existing T-1 net management systems and provide a migration path to future standards, such as the Synchronous Optical Network (SONET) international standard.

But most observers said it is too soon to tell which vendors will be victorious in the T-3 market because user demand is not expected to ramp up for a few more years.

According to Rick Malone, a principal at Vertical Systems Group, a consulting company in Dedham, Mass., the T-3 business will not be profitable for any vendor until about 1993.

Malone said he expects users to spend about $10 million on T-3 equipment in 1989 and $18.4 million in 1990. From there, user spending on T-3 equipment is expected to grow about 85% a year to reach $117.5 million in 1993, according to a Vertical Systems report titled "T-1 Network Industry Analysis: 1989."

The early vendor . . .

While the market is small today, vendors are wise to enter it early, Malone said. Falling T-3 transmission rates and increasing usage of high-bandwidth applications, such as videoconferencing, are creating a greater need for T-3 equipment.

In fact, the need to hasten products to market is what is encouraging some vendors to bring in outside help.

Timeplex could have devel-

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Briefs

Legal hacking. Nippon Telegraph & Telephone, Ltd. (NTT) has announced a cash award for anyone who can successfully crack the encryption scheme it uses on its private network. NTT said it would pay one million yen, or about $7,000, to the person or organization that can successfully decode the 64-bit Fast Data Encipherment Algorithm, called FEAL-8. The contest ends Aug. 31, 1991. A spokesman for NTT America, Inc. in New York said NTT is sponsoring the contest to assure users that its network is secure.

A taxing situation. The Banker's Electronic Data Interchange Council said it will develop EDI standards that will enable corporations to use the National Automated Clearinghouse Association's (NACHA) electronic funds transfer network to pay state taxes. The NACHA-sponsored council will work with the Federation of State Tax Administrators, the National Corporate Cash Management Association and the ANSI X12 committee to formulate the EDI message formats.

Far-reaching ISDN. Communications Satellite Corp. plans to conduct the world's first Integrated Services Digital Network demonstration across three continents at the Tele-Communications Association, Inc.'s annual TCA-89 conference, which will be held Sept. 26 to 28 in San Diego. The demonstration will feature a Basic Rate Interface link supporting picture telephones, file transfer and slow-scan compressed video among San Diego, Singapore and Sydney, Australia.

Novell ships NetWare 386. Novell, Inc. last week started shipping NetWare 386 Version 3.0, a 32-bit implementation of its NetWare network operating system optimized for the Intel Corp. 80386 microprocessor. Compared to earlier NetWare releases, NetWare 386 offers simplified installation, support for up to 250 users on one server, enhanced security and printer services, as well as dynamic resource configuration.

Sprinting ahead with FTS 2000. Last week the Small Business Administration (SBA) became the first federal agency to agree to buy enhanced services from US Sprint Communications Co. as part of the Federal Telecommunications System 2000 contract. The SBA plans to use dedicated circuits from US Sprint to link more than 100 offices to its Washington, D.C. computing center.

Holiday threat. At least two potentially disruptive DOS viruses are expected to be time-released in the U.S. on Columbus Day next month, according to Centel Federal Systems, Inc., a Reston, Va.-based systems integration firm for the federal government. The anticipated viruses, which are believed to have originated from outside the U.S., have been a hot topic of discussion among computer hackers, said Ed Hale, director of marketing for Centel Federal. In response to the virus threat, Centel Federal has developed software to help its clients check their software for traces of the viruses and has established a hot line to its security experts that its clients can reach at (800) 843-4850.

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Service allows user access to carrier operating info

By Barton Crockett
Senior Editor

NASHVILLE — BellSouth Corp. last week announced plans to offer a service that lets users reconfigure and obtain information about their networks by accessing the carrier's internal computer systems.

With Customer Network Management/Administrative Management Service (CNM/AMS), BellSouth will let customers use a terminal or microcomputer to reconfigure Centrex lines and T-1 circuits, access billing information, file trouble reports and request a variety of new services.

"This is something users have wanted for years," said Bill Dove, director of telecommunications at the University of North Carolina at Greensboro. "It [will] help us get a better handle on what's happening inside our network."

BellSouth announced and demonstrated CNM/AMS here at the annual conference of the Southeastern Telecommunications Association (SETA), a regional users group.

CNM/AMS will enable BellSouth customers to access the same information the carrier uses to operate its business. For example, users will be able to log onto BellSouth's mainframe-based billing system and look up such information as payments received and balances outstanding.

> Users will be able to log onto BellSouth's billing system and look up information.
>
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CNM/AMS will also give users access to the carrier's digital access and cross-connect systems to perform such tasks as rerouting traffic on T-1 lines running from user premises to BellSouth points of presence.

The service will allow users to electronically file trouble reports about network service difficulties and then monitor BellSouth's progress by viewing technician service logs maintained on the carrier's mainframes.

CNM/AMS also lets a user initiate or block various Centrex features such as call forwarding.

Customers access the functions via dial-up or dedicated 9.6K bit/sec connections to BellSouth minicomputers, which work as front ends to BellSouth's internal computer systems.

According to Ken Scheinert, a BellSouth product marketing manager, CNM/AMS will be available throughout the carrier's nine-state service area by the first quarter of 1990 and will cost approximately $10 to $20 per month, depending on the number of features used.

Although other carriers currently enable users to reconfigure Centrex lines and T-1 lines, Pat Greene, BellSouth's vice-president of marketing, said no other regional Bell holding company lets users access billing, trouble reporting and service request systems.

But other carriers such as MCI Communications Corp. and AT&T have already announced plans to offer services similar to CNM/AMS as part of their respective Integrated Network Management Services and Accumaster network management offerings.

Several users at the SETA show praised carrier efforts to provide these kinds of capabilities. "I need to get better access to this kind of information so that I have a better idea of what's going on in my network," said Mindy Kurts, a telecommunications voice analyst at the United Methodist Publishing House based here.

Some users, however, cautioned that the services pose risks.

According to Gene Webb, assistant director of information and communications services for the city of St. Petersburg, Fla., opening up carrier computer and switch systems increases the threat of viruses and sabotage.

"It's a multifaceted demon," he said. BellSouth executives dismissed such security concerns.

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DCA reprices Irmalan line, adds client delivery device

Server pack downloads client portion ás needed.

By Susan Breidenbach
West Coast Bureau Chief

MOUNTAIN VIEW, Calif. — Digital Communications Associates, Inc. last week announced a new pricing method and features for its Irmalan family of local network-to-mainframe communications products.

A license for the Irmalan gateway, which runs on a file server on any Network Basic I/O System-compatible local network, can now be purchased for 16 or 64 concurrent users.

A software-only gateway will work with standard token-ring interface hardware; a second version is bundled with an IBM Synchronous Data Link Control adapter that enables the server to emulate an IBM 3274/76 controller.

Previously, Irmalan users had to purchase separate client software to install in each workstation accessing the gateway. The product has been enhanced to allow the server software to download the client portion to workstations as they are added to the network.

New delivery mechanism

"We came up with this new delivery mechanism because our customers told us they wanted to purchase a single-server license," said George Moore, vice-president and general manager of local network communications for DCA's personal computer communications group.

Other enhancements to the Irmalan software include expanded IBM logical unit support and graphics capabilities.

The enhanced logical unit support lets network administrators reserve a portion of available logical units for users or machines that require frequent host sessions, while assigning a pool of logical units for users and devices that access the mainframe less frequently.

> "The relationships [between the different entities] are so fragile," DCA's Moore said.
>
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Previous versions of Irmalan products made logical units available only on a first-come, first-served basis.

The new Irmalan software also provides full-screen emulation of the IBM 3278 Model 7 terminal on personal computers equipped with Video Graphic Array adapters and NEC Corp.'s NEC Multisync II or Multisync IIID monitors. This gives IBM Personal System/2 users display dimensions of 27 rows by 130 columns.

Moore said the Irmalan enhancements are evidence that DCA, which is developing the communications server for Microsoft Corp.'s OS/2 LAN Manager network operating system, is maintaining two competitive strategies with respect to DOS and OS/2 networking. "There will continue to be a lot of demand for DOS, and you will see some major DOS introductions from us by the end of the year," he stated.

DCA, which owns 10NET Communications with its DOS-based 10NET network operating system, is also a LAN Manager licensee that had originally scheduled its LM Select version of LAN Manager for release in the first quarter of this year.

Moore declined to provide a new release date, but said DCA was going to start delivering LM Select to beta-test sites this month.

"We have to get delivery and support mechanisms in place before we can release it," he said.

Making a cohesive whole

Moore acknowledged the problems DCA has had blending 10NET Communications and other acquisitions into a cohesive business operation. "We had plans to bring everything together right away, but it just isn't that easy," he said. "The relationships [between the different entities] are so fragile. We have to do the integration carefully, piece by piece."

However, Moore added, "I think we've gotten out of the lethargy we were in and are starting to get aggressive."

Moore said DCA's traditional Irma board business has remained strong, despite the trend away from direct microcomputer-to-mainframe connections and toward shared local network links. The problem, he said, is that off-the-shelf distributed applications that would really exploit network computing haven't materialized.

"Distributed applications are coming, but they are being custom-built for individual corporate users," Moore said.

Irmalan server licenses are available now in three different packages. The Irmalan 802.2 Gateway Server is priced at $2,995 for 16 users and $4,995 for 64 users. The Irmalan SDLC Gateway, bundled with an SDLC board, costs $3,495 for a 16-user license and $5,495 for a 64-user license.

There is also an Irmalan Distributed Function Terminal (DFT) Gateway 2 Server option that consists of a personal computer-based gateway equipped with as many as four Irma boards that attach the microcomputer directly to an IBM cluster controller. Each board supports up to five concurrent sessions, for a maximum concurrent-user total of 20.

Users of DCA's existing 802.2 and SDLC gateways can upgrade to 16- or 64-user licenses for $995 and $2,195, respectively.

DFT gateway users can obtain software-only upgrades for $195 per five concurrent users.

Codex wins big Defense Dept. deal

By Paul Desmond
Senior Writer

BELLEVILLE, Ill. — The Department of Defense last week awarded Codex Corp. a modem contract that may be worth up to $51 million over a five-year period.

The Defense Commercial Communications Office (DECCO), a contracting arm of the Defense Department, awarded Codex a one-year contract with an option for four more years. The contract calls for Codex to supply an array of dial-up and leased-line modems ranging in speed from 2400 to 19.2K bit/sec, as well as data service units and channel service units.

Defense Department agencies that participated in the contract will get up to 1,500 modems per month through DECCO, according to Maj. Scott Bowles, assistant deputy director, procurement directorate for DECCO at Scott Air Force Base here. Some civilian agencies, such as the Federal Aviation Administration, will also get modems through DECCO, Bowles said.

DECCO decided to contract with a single vendor for uniformity. "Now we have a standard family of modems out there for five years," he said.

Bowles declined to detail why DECCO chose Codex over its competitors or what other companies bid for the contract.

He did say, however, that DECCO would pay a fixed price for all modems over the life of the five-year deal. He would not disclose those prices but said they varied depending on the options chosen with each modem.

Chris Carroll, media relations manager for Codex, said some of the modems will be supplied by Codex's sister company, Universal Data Systems, Inc. (UDS) of Huntsville, Ala. Both Codex and UDS are owned by Motorola, Inc. He declined to specify how many or what type of modems UDS will supply.

Carroll also said the contract is part of a corporate strategy to land more government contracts. "This is part of our effort as a corporation to work more in the federal systems business," he said. "We view that as a growth area."

Analysts said the deal could help Codex achieve that goal. According to Larry Cynar, an industry analyst with the San Jose, Calif. consultancy Dataquest, Inc., Codex could then point to this modem contract as it tries to secure deals with the Defense Department and other agencies for products with higher profit margins like T-1 multiplexers and X.25 packet-switching equipment.

N.C. State prof pushes for ISDN operability testing lab

By Tom Smith
New Products Editor

RALEIGH, N.C. — A North Carolina State University faculty member has sought the aid of major network vendors to form an ISDN laboratory here that would allow users and vendors to develop ISDN applications and perform interoperability testing.

Discussions on the proposed Integrated Services Digital Network lab are still in the exploratory stage, according to George Abbott, director of special projects in telecommunications at the university's College of Engineering. He is hoping the vendors will provide services, equipment or funding for the laboratory.

Abbott said he is optimistic that vendors will back the project. The companies he has approached, including Northern Telecom, Inc. and Southern Bell Telephone and Telegraph Co., have expressed interest but have offered no formal backing.

Members of Northern Telecom's nearby Technical Education Center are advising the university on what will be required to get the lab running, according to Rick Gonzalez, manager of educational programs development at the center.

"We're considering ways to support the project if we can," said Robert Morrow, manager of public information for Southern Bell.

Abbott began discussing the idea with vendors about a year ago, and in June, he detailed how the center would be used. "A vendor or [user] that developed a product could bring it here and find out if it will work with other products in a multivendor environment."

He said the lab would be open to anyone, possibly for a fee, though such details have not been finalized. "To make it useful, it has to be open to everyone."

Other details, such as the exact location and cost of the facility, are yet to be resolved. Abbott hopes the vendors will respond by the end of the year. He declined, however, to predict when work on the lab could begin or when it might be opened.

Abbott cited several possible providers of ISDN service, but said he hopes Southern Bell will offer ISDN service from the central office that serves the university. That central office, which does not support ISDN services, is equipped with a Northern Telecom DMS-100 switch, according to Southern Bell.

"Failing that, I'll have to get an equipment vendor to donate, loan, or sell us a cut-rate switch to run this thing," Abbott said.

Abbott thinks an ISDN center would help the university fulfill its obligation to serve the citizens of North Carolina. "We're trying to get ISDN in the hands of potential users so they can invent applications."

He hatched the idea out of frustration over the "continuing litany" of ISDN shortcomings cited by users and vendors: lack of established standards, lack of equipment and lack of services.

"I said, 'Maybe we can do something constructive here. If we establish this kind of facility, we can demonstrate some services, do some compatibility demonstrations and maybe even come to the point of doing conformance testing.' "

Although the lab Abbott envisions is similar to one proposed for Rochester, N.Y. ("Plan for N.Y. ISDN center moves ahead," *NW,* Aug. 7), he said his plan was developed "in a vacuum" and had no relation to the Rochester effort. The Rochester proposal calls for a center that would aid users and vendors in the development of ISDN products and applications, as well as interoperability testing. The Rochester center was proposed by two members of the North American ISDN Users (NIU) Forum, but it does not have the formal backing of the forum.

When he learned of the Rochester effort, Abbott contacted several members of the NIU Forum, who expressed support for his initiative.

"The door is open for him to come to the forum and seek support from us," said James Kendrick, chairman of the NIU Forum's Users Workshop. "That could include all kinds of support, such as technical support from the implementors' side."

Grocery store wholesaler banks on EDI

By Barton Crockett
Senior Editor

EDEN PRAIRIE, Minn. — A grocery store wholesaler is embracing electronic data interchange standards that promise to save it millions of dollars by improving inventory management.

Already recognized as one of the country's largest users of grocery industry EDI standards, Super Valu Stores, Inc., based here, is working to adopt nascent EDI standards for receiving notices from its suppliers concerning price changes, promotions and new products.

By tracking this information electronically, Super Valu expects to be able to give its buyers more timely and accurate purchasing information. This, in turn, should allow Super Valu to better manage inventories and run its business more efficiently, according to Greg Zwanziger, food systems accounting manager at the company and head of the firm's EDI efforts.

"We feel that getting our suppliers to do this would improve our operating efficiency by at least 1%, representing a $1 million [per year] savings," Zwanziger said.

"Over time, the efficiency improvements could be much larger, around 20% to 40%, putting the savings in the multimillion-dollar range," he added.

Largest user

Super Valu, which pulled in $10.3 billion in revenue last year, is the largest U.S. user of grocery industry EDI standards, according to Ralph Roll, vice-president of Dayton, Ohio-based Uniform Code Council, Inc. The council establishes the grocery industry's EDI Uniform Communications Standards (UCS).

Super Valu's 18 divisions send out anywhere from 50% to 80% of their purchase orders via EDI and receive 30% of their invoices via EDI. The company expects to ramp up these numbers to 80% for purchase orders and 60% for invoices by year end, according to Zwanziger.

Sending and receiving purchase orders and invoices via EDI currently saves Super Valu in excess of $1.5 million per year in data entry, postage and labor costs, he said.

By broadening use of EDI to track notifications about price cuts, new products and promotions, Super Valu hopes to realize a new breed of savings.

Although only a few grocery companies use EDI to communicate this type information, Super Valu is trying to persuade its suppliers to pick up the crusade in an effort to improve inventory management, Zwanziger said.

As a middleman to grocery stores, managing inventory is Super Valu's bread and butter. The company purchases dry goods and perishables from thousands of suppliers and resells them to independent grocery stores. Anything the firm can do to expedite the delivery of goods and trim purchase prices flows to its bottom line.

One impediment to managing inventories effectively is the deluge of paper notices the company receives from thousands of suppliers about promotions, price changes and new products.

Paper deluge

Traditionally, these announcements have been mailed to buyers at Super Valu's 21 warehouses, where they were filed, entered into ledgers or given to data entry personnel to be input into mainframe data bases.

As a result, buyers often missed promotions or tried to take advantage of price cuts that were no longer available. "Buyers end up thinking they can get things at different prices than the vendors are selling them for," Zwanziger said. "This is one of the biggest areas that causes friction between buyers and vendors." It also costs Super Valu money.

The company likes to stock up when vendors offer particularly favorable short-term price cuts, but it may miss the opportunities if the buyers do not see the promotions. Likewise, if buyers think they are getting price cuts that are no longer available, Super Valu's inventories can get needlessly bloated.

By getting vendors to deliver price change, promotion and new

(continued on page 50)

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Cable & Wireless launches new nationwide 800 service

Carrier targets small and midsize customers.

By Gail Runnoe
Washington Correspondent

VIENNA, Va. — Cable & Wireless Communications, Inc., the U.S. subsidiary of Britain's Cable & Wireless PLC, last week said it will begin offering nationwide toll-free 800 service.

Users of Cable & Wireless' Nationwide 800 service will be charged a flat per-minute rate based on the time of the call; charges will not be based on distance. Calls can originate anywhere in the U.S., Puerto Rico or the Virgin Islands.

Businesses will be able to use existing telephone lines for receiving 800-number calls that originate in state and out of state. Judy Durkin, marketing manager with Cable & Wireless Communications, said the service is targeted at small and midsize business customers with a need to terminate 800 service on regular access lines.

Three rates

There are three rates for the Nationwide 800 service: a day rate of 19.99 cents per minute, an evening rate of 16.99 cents per minute and a night rate of 13.99 cents per minute.

Nationwide 800 service also provides volume discounts of 5% for monthly bills ranging from $50.01 to $350, 10% for bills between $350.01 and $1,350, and 15% for bills over $1,350.

Durkin said users will receive call detail reports with each billing statement. The reports break down traffic by hour of the day, day of the week and day of the month.

> Durkin said users will receive call detail reports with each billing statement. The reports break down traffic by hour of the day, day of the week and day of the month.
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They also show the number of calls made, the number of minutes billed and the percentage of total minutes in each of the above time classifications.

"Most carriers give customers raw information, not organized in any usable fashion," Durkin said. Nationwide 800's billing summaries will help businesses make sense of their bills, she said.

Cable & Wireless Communications plans to enhance the Nationwide 800 service over the next two months with new capabilities such as call routing.

Cable & Wireless Communications began offering in-state toll-free 800 service in Massachusetts, Florida and Texas within the past year. This is the company's first national 800 service offering.

Cable & Wireless Communications estimates that the toll-free 800 market is a booming one and will grow from a level of $5.1 billion this year to $6.8 billion in 1992.

Ameritech, Bell Atlantic strikes end

By Gail Runnoe
Washington Correspondent

WASHINGTON, D.C. — While strikes continued at telephone companies in New York, New Jersey and New England last week, union workers at Ameritech and most Bell Atlantic Corp. operating companies returned to their jobs.

At press time, approximately 40,000 members of the Communications Workers of America (CWA) and 20,000 members of the International Brotherhood of Electrical Workers (IBEW) in the Nynex Corp. region remained on the picket line after walking off their jobs Aug. 6.

More than 9,000 IBEW workers at New Jersey Bell Telephone Co. also remained on strike though all other IBEW and CWA workers in the Bell Atlantic region had reached tentative agreements.

IBEW representatives and New Jersey Bell met for only a few hours last week after reaching an impasse over health care issues. Talks are slated to resume tomorrow.

Nynex representatives were still at the bargaining table with the CWA and IBEW as of press time last week, continuing talks that began last Wednesday. Neither Nynex nor the CWA would comment on the status of the talks, but a CWA spokeswoman said all contract items were being reviewed.

The five Ameritech Bell operating companies and Ameritech Services, Inc. also settled disputes last week with 37,000 CWA workers.

Settlements were reached earlier in the month with the carrier's approximately 14,000 IBEW workers.

Raycom Systems readies 100M fiber mux for TCA

FiberRing 100 links in point-to-point, ring fashion.

By Tom Smith
New Products Editor

BOULDER, Colo. — Raycom Systems, Inc. this month is scheduled to introduce at the Tele-Communications Association, Inc. show in San Diego a 100M bit/sec fiber-optic multiplexer that supports high-speed virtual circuits between similar devices or local networks.

The multiplexer, the FiberRing 100, can be used to link devices in a point-to-point fashion or configured with up to 15 other multiplexers in a ring, said Paul Adams, Raycom's president.

Each multiplexer supports up to three I/O modules. Interfaces are available for RS-232, RS-422, V.35, T-1, Arcnet, token-ring, Ethernet and IBM 3270 devices. The base product is priced with one I/O module, and more interfaces have to be purchased separately.

Fiber channels are dedicated to links between like interfaces. The multiplexers preassign 7M bit/sec to each channel — meaning the total 100M bit/sec bandwidth can support a maximum of 14 connections. With one I/O module required at each end of these 14 virtual circuits, the maximum number of interfaces a system can support is 28.

If a user had four I/O modules per multiplexer, the network could consist of a maximum of seven FiberRing 100s.

Individual multiplexers can support more modules using expansion chassis, each of which requires one interface slot in the host multiplexer. With the maximum of two expansion chassis, a single multiplexer node can accommodate 10 interfaces.

FiberRing 100s employ a counterrotating ring topology, similar to that used in Fiber Distributed Data Interface (FDDI) nets, for fail-safe operation. Each multiplexer has two fiber-optic transceivers, one that operates in a clockwise direction, the other counterclockwise. In the event of a cable failure, data moving in one direction reverses direction and is rerouted so it can reach its destination, Adams explained.

Net management functions, supported using an IBM Personal Computer or compatible, include the ability to initialize and configure the multiplexers, assign names to multiplexers and modules, and perform loop-back tests after an alarm has been received.

Distance between individual FiberRing 100s on a network can extend to 10 km, Adams said.

Raycom's FiberRing 100 is an upgraded version of the company's 5101, which supports two RS-232 interfaces over 14M bit/sec links, and the 5110, which supports four RS-232 interfaces over 28M bit/sec links. The company described the product as a step in its migration to FDDI.

"Our customers wanted to connect more than two points together, and they wanted more capacity," Adams said. "This product, which is an upgrade from our current multiplexers, gives them that."

A base model of the FiberRing 100 with one I/O module will cost $8,000. A version with four I/O modules will cost $16,000. Modules range in price from $850 for an RS-232 interface with 36 RJ-11 connectors to $2,450 for a synchronous V.35 interface with four channels. Expansion chassis cost $3,000. All the products are scheduled to be available in December.

Adams said FiberRing 100 is not designed to compete with FDDI products. "We don't believe this product can go up against FDDI nose-to-nose because it has less connectivity. The product is something more than our current muxes, but maybe something less than FDDI in terms of performance, and indeed, that's what its price turns out to be as well."

The firm's first FDDI product will be an Ethernet bridge that should enter the beta-testing stage in the first quarter of 1990, Adams said. Future offerings will include a multiport Ethernet bridge and a token-ring bridge.

Firm installs net, waits on tariff

continued from page 1

al field offices, which currently use WATS services, to its headquarters here. AT&T estimated the value of the three-year contract to be between $30 million and $40 million.

"We went with SDN because we determined that the service would pay for itself in less than 30 days," Chiazza said. "Anything beyond that is pure savings for Lincoln National."

Although the SDN promises savings, Lincoln National only contracted for two million minutes of traffic per year. The company's field offices, which range in size from 10 to 50 employees, can supplement their needs with other carriers.

In an effort to get the best possible rates for field sites, the company hopes to spur competition by using an SDN service option to collect per-site traffic data, which will then be given to AT&T rivals to use in bid proposals.

"This will enable MCI and US Sprint to quote their best price quickly based on the same traffic information," Chiazza explained. The SDN Service Management System option lets customers access SDN data bases and download calling data.

> AT&T estimated the value of the contract to be between $30 million and $40 million.
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Lincoln National seeks, and receives, special treatment from carriers because it is a major national account. The company waits for the carriers to propose network redesigns, price concessions, new services and other special arrangements.

"We're in a great position. Being a major national account makes our job easier because of the top three carriers' aggressive nature and pricing. And the bottom line is, Lincoln National saves money," Chiazza said.

> According to Chiazza, the service should pay for itself in less than 30 days.
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But the company is aggressive in its own right when it comes to networking. Lincoln National bypasses Indiana Bell Telephone Co. with a direct fiber link to AT&T's point of presence across town.

Lincoln National recently struck a deal with AT&T to back up traffic on the bypass link. Under the agreement, AT&T technicians will divert Lincoln National traffic to AT&T's South Bend, Ind., point of presence if the carrier's point of presence in Fort Wayne is disabled.

The SDN deal with AT&T is the culmination of three years of designing and planning. The company had rejected past SDN proposals in part because of the high cost of adding network sites. But a recent SDN tariff restructuring that addressed these items drew Lincoln National to the virtual net service.

NEC to unveil enhancements for its NEAX 2400 line of switches

Firm to offer new switch processor, software and ISDN PRI.

By Bob Wallace
Senior Editor

SAN DIEGO — NEC America, Inc. will introduce a raft of enhancements for its NEAX 2400 line of digital private branch exchanges at the Tele-Communications Association, Inc.'s annual TCA-89 conference here later this month.

NEC will roll out a new, more powerful switch processor, new switch software and an Integrated Services Digital Network Primary Rate Interface for its NEAX 2400 PBX line, according to analysts briefed by NEC.

The switch maker will also unveil double-density line interface cards that will enable the PBX to support more stations. In addition, the firm is expected to release a program intended to encourage software developers to write programs based on its open applications interface.

"They're not replacing the switch, they're just improving it," said Patrick Riley, voice communications manager for First Florida Bank, N.A. in Tampa and an officer of the NEAX 2400 Users Group.

According to sources, NEC has replaced the 2400's 16-bit processor with a more powerful 32-bit processor that will boost the switch's call-processing capabilities and enable it to support more add-on systems.

The NEAX 2400 software, originally written in a proprietary language, has been rewritten in C. Use of a standard programming language is expected to make it easier to administer the switch and develop future enhancements such as PBX-to-host applications.

Sources said NEC will also introduce an ISDN Primary Rate Interface for the 2400 that will enable it to work in both public and private network applications. ISDN Primary Rate Interface specifies how a T-1 is configured to support 23 voice and data communications channels, as well as one signaling channel, which can support packet-switched data communications.

The NEAX 2400 supports from 32 to more than 20,000 lines.

All enhancements will be generally available beginning in the first quarter of 1990, consultants said. ◘

> "They're not replacing the switch, they're improving it."
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Metromedia buys up ITT's long-haul units

By Bob Brown
Senior Editor

SECAUCUS, N.J. — Metromedia Co., parent of Metromedia Long Distance, Inc., last week announced the acquisition of ITT Corp.'s long-distance carrier units — ITT Communications Services, Inc. and ITT Chernow Communications, Inc.

Financial terms of the agreement, which were detailed in a letter of intent signed in March, were not disclosed.

The buy makes Metromedia Long Distance one of the five largest long-distance carriers in the U.S., according to a spokeswoman for the carrier.

ITT Communications Services provides Metromedia private-line services for voice

(continued on page 49)

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IBM shares future vision

continued from page 1

Major users who were interviewed last week agreed that SNA needs to be strengthened in those areas (see "Users hail SNA but look for future advancements," this page).

SNA, 15 years old next week, was introduced in response to the emergence of minicomputers, according to Ed Sussenguth, the first director of SNA architecture and now an IBM fellow. SNA was also intended to help users migrate away from the 35 transport protocols used at the time.

"The goal of SNA . . . was to try to maintain some kind of consistency for customers in their telecommunications network while giving them the ability to change as technologies and functions changed and as [their] networks grew," Sussenguth said.

One of the changes SNA now faces is the emergence of Open Systems Interconnection standards.

"A few years ago, it would almost have been heresy to talk about OSI in a building [where people work on] SNA," said Rick McGee, manager of communication systems architecture at IBM. "Today, I have quite a number of people whose job it is to work on OSI and on OSI and SNA together."

Two of the first fruits of IBM's OSI labors are the OSI/Communications Subsystem (CS) and the Common Programming Interface for Communications (CPI-C).

OSI/CS, due out in March 1990, promises to let OSI-compliant applications running on an MVS or VM host communicate with OSI applications on other hosts running a compatible set of OSI protocols ("Networks shine in IBM product rollout," *NW*, Sept. 26, 1988).

OSI/CS addresses Layers 3 to 6 of the OSI model and only works with applications that comply with Layer 7, said John Hunter, director of architecture and telecommunications within IBM's communication systems. Today, those are limited to X.400 electronic mail and File, Transfer, Access and Management.

Rich McGee

"I see that as a first step toward OSI. Over time, I see a much closer coupling between SNA and OSI," Hunter said. "I envision us building the OSI standards into SNA."

The company will try to accomplish that by using SNA to complement OSI, not by replacing SNA protocols with OSI. A user who put a fully OSI-compliant piece of hardware in an SNA network would, therefore, lose some of the benefits of SNA, including SNA security and network management, Hunter said.

"You would then be relegated to the common subset, the lowest common denominator" between OSI and SNA, he said.

Another key to IBM's current OSI strategy is CPI-C, McGee said.

With CPI-C, "a user can write an application to a single set of services, and that application can run unchanged over SNA sessions or OSI connections," he said. Within SNA, CPI-C uses LU 6.2 sessions, and for OSI, it uses the evolving OSI transaction processing standards.

CPI-C is an application-layer protocol that eases the task of getting data from one processor to another but does not address how data is processed ("CPI-C key to tying non-IBM units, SNA," *NW*, May 8).

Another challenge IBM faces in improving SNA is meeting customer requirements for ease of use, McGee said. "One of our goals is to drastically reduce the number of system programmers it takes to maintain these networks," he said.

To address that need, IBM is working on migrating some of the capabilities of its Advanced Peer-to-Peer Networking (APPN) scheme — which addresses only the System/3X and Application System/400 systems — into its other processing environments.

APPN capabilities include dynamic route selection, which enables intelligent nodes to select network data paths based on various factors, including priority, speed and failed links. This would eliminate the need to keep predefined routing tables.

Similarly, dynamic distributed directory support would let users add or delete nodes without having to change system generations, he said.

Today, the lion's share of networking intelligence resides in VTAM on the mainframe and in the Network Control Program (NCP) running on the front-end processor, Hunter said. IBM's vision is to distribute that intelligence to other nodes in the network, such as cluster controllers.

Setting up sessions and routing routines then could be handled by a myriad of network nodes, without involving NCP or VTAM, McGee said. "In the future, we see the host using the communications controllers mainly as access points into the intelligent network," he said.

IBM faces two challenges in turning that vision into reality. First, it must ensure that APPN-type functions designed for mid-range processors will work in a large-scale mainframe environment without sacrificing performance. And second, it has to devise a strategy for migrating its massive installed base of mainframe customers to APPN-like networks.

McGee said that someday, an IBM Personal System/2 will be able to communicate with a mainframe as a peer, although he did not say when that day might come.

He also said IBM is looking to tailor SNA to better support users' growing number of local networks. For example, IBM wants to make SNA a better vehicle for interconnecting far-flung local nets over a wide area. One way that may be accomplished is by eliminating the need to transport the full protocol stack between remote local nets.

"There may be certain efficiencies that we can take in terms of how we route the data and how we establish the connection across the backbone to provide extremely good perfomance," McGee said.

Ed Sussenguth

Network management

Network management is another key area where IBM faces challenges, Hunter said. One challenge is to embrace OSI, which the company plans to do by using OSI/CS as a NetView interface for OSI-based net management systems.

Although the OSI network management protocol definitions are nearly complete, Hunter said there is still work to be done to consistently define the various entities that need to be managed in multivendor nets.

He said network management in general is going to be essential as the company moves into the 1990s. "It will become fundamental to our customers and to our continued success."

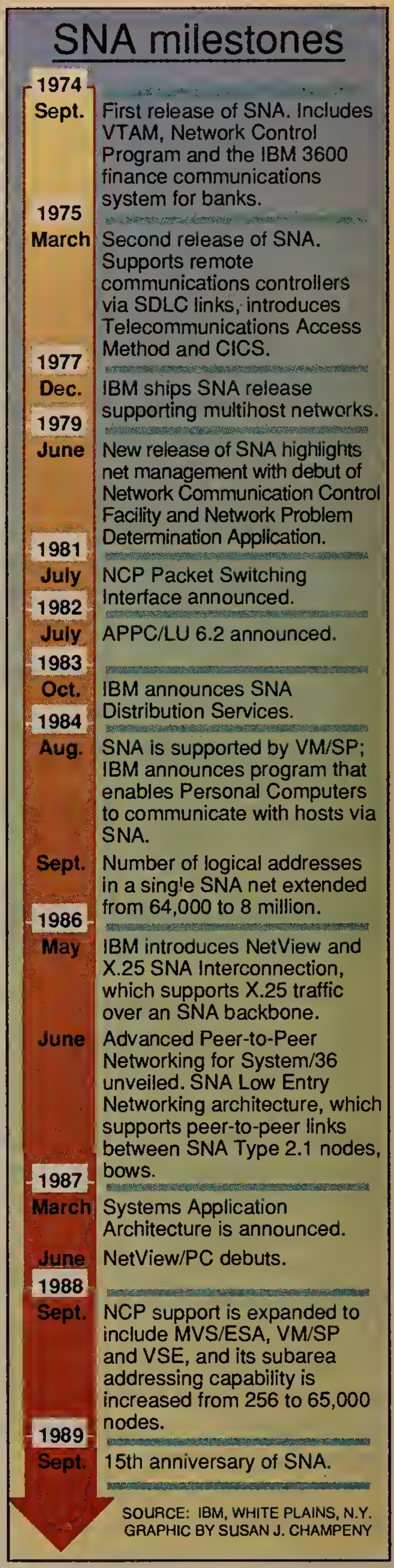
IBM recently filled in a missing piece in its net management strategy by acquiring a graphic user interface for NetView from US West Network Systems, Inc. but still faces the problem of automating some net management tasks, he said.

Although IBM is actively working on incorporating artificial intelligence into NetView, Hunter stopped short of saying when AI might be available.

Sussenguth, who has had a hand in how SNA evolved over the past 15 years, is confident SNA can weather its current challenges.

"The architectural framework and process that was laid in place has continued to survive over 15 years," he said. "From where I sit today, I see it continuing to evolve into the future." ☑

SNA milestones



1974	Sept.	First release of SNA. Includes VTAM, Network Control Program and the IBM 3600 finance communications system for banks.
1975	March	Second release of SNA. Supports remote communications controllers via SDLC links, introduces Telecommunications Access Method and CICS.
1977	Dec.	IBM ships SNA release supporting multihost networks.
1979	June	New release of SNA highlights net management with debut of Network Communication Control Facility and Network Problem Determination Application.
1981	July	NCP Packet Switching Interface announced.
1982	July	APPC/LU 6.2 announced.
1983	Oct.	IBM announces SNA Distribution Services.
1984	Aug.	SNA is supported by VM/SP; IBM announces program that enables Personal Computers to communicate with hosts via SNA.
	Sept.	Number of logical addresses in a single SNA net extended from 64,000 to 8 million.
1986	May	IBM introduces NetView and X.25 SNA Interconnection, which supports X.25 traffic over an SNA backbone.
	June	Advanced Peer-to-Peer Networking for System/36 unveiled. SNA Low Entry Networking architecture, which supports peer-to-peer links between SNA Type 2.1 nodes, bows.
1987	March	Systems Application Architecture is announced.
	June	NetView/PC debuts.
1988	Sept.	NCP support is expanded to include MVS/ESA, VM/SP and VSE, and its subarea addressing capability is increased from 256 to 65,000 nodes.
1989	Sept.	15th anniversary of SNA.

SOURCE: IBM, WHITE PLAINS, N.Y.
GRAPHIC BY SUSAN J. CHAMPENY

Users hail SNA but look for future advancements

By Jim Brown
Senior Editor

Some of IBM's largest customers last week praised the company's efforts to enhance Systems Network Architecture over the years but said IBM must still improve SNA's net management capabilities and offer better links to other architectures, especially Open Systems Interconnection.

Interviewed on the eve of SNA's 15th anniversary, users said IBM has worked hard to perfect SNA as a means of moving data between IBM processors.

But they said IBM must break SNA's hierarchical shackles to support true peer-to-peer networking. Users also expressed concern that IBM's major commitment to developing its Systems Application Architecture (SAA) could hinder efforts to advance SNA.

"What's in place today is really meeting 95% of our requirements," said Gary Weis, senior vice-president with Sears Technology Services, Inc., the technology arm of Sears, Roebuck and Co. Improvements to IBM's NetView network management software could very well provide the other 5%, he said.

While NetView is capable of managing Sears' SNA network, Weis said IBM needs to make the software easier to use and that it must tweak it for better performance. Weis declined to name the specific functions IBM needs to add to NetView.

Room for improvement

Other users agreed SNA needs stronger management capabilities. "SNA is a very rich function architecture," said Chris Skeadas, vice-president and general manager of communications systems for Bank of America National Trust & Savings Association in San Francisco. "That isn't to say its perfect. If there is an area for improvement, it's in network management."

NetView could support more corrective capabilities that are automatically invoked when a network problem occurs, users said. IBM must also ensure that NetView can monitor and control the growing number of microcomputers that are linked to SNA via IBM Token-Ring Networks.

SNA users also said IBM needs to improve SNA's ability to communicate with other networks, especially those based on the OSI model. "I think IBM has to get more involved with the standards organizations, and they have begun that," Skeadas said. "IBM has realized it cannot survive into the year 2000 by erecting barriers to isolate itself."

Customers said IBM has been more willing in recent years to provide links to other networks. "IBM has been burned pretty badly for trying to suggest forced marches," Skeadas said. "Forced marches only force a march to an alternative that is not IBM."

But users aren't asking IBM to abandon SNA. With so much already invested in their SNA networks, users want IBM to support OSI protocols within SNA rather than force them to adopt a pure OSI implementation. They said they are looking to IBM to build OSI gateways that allow OSI applications to be supported across an SNA network.

Users applauded IBM for its effort to move away from a hierar-

(continued on page 50)

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"IBM's market domination has passed. The number of products and buyers has become too dispersed for any one company to maintain control at the level that IBM did in the 1970s and early 1980s."

John McCarthy
Director of professional systems research
Forrester Research, Inc.
Cambridge, Mass.

People & Positions

James Unruh last week was elected president and chief operating officer of **Unisys Corp.** by the company's board of directors.

The move is seen by industry observers as putting Unruh in line to succeed Michael Blumenthal as company chairman. Unruh has been a director and executive vice-president of Unisys, a Blue Bell, Pa.-based company, since 1986. Unisys' board of directors also promoted **Curtis Hessler** to vice-chairman from executive vice-president. Hessler, who is also a director, continues as chief financial officer and remains in charge of the company's Defense Systems Group, Corporate Staffs and Corporate Planning.

Robert Degan last week was named president and chief executive officer at **Avanti Communications Corp.,** a Norwood, Mass.-based T-1 multiplexer vendor.

Degan and his senior management team have targeted September for making announcements regarding the company, its customers and products. Previously, Degan was president and chief executive officer of Amnet, Inc., a provider of X.25 packet-switching products. Degan replaces Peter Boni and Robert Antonuccio, both of whom were occupying the president's office at Avanti as executive vice-presidents.

Study details reasons for sluggish MAP acceptance

Users require wider availability of Version 3.0.

By Bob Brown
Senior Editor

BOSTON — A new report on the Manufacturing Automation Protocol market concludes that acceptance of the factory networking standard hinges on greater availability of MAP Version 3.0 products and the success of early users.

The Yankee Group report, titled "Industrial Networks: Standards Update," discussed key factors in the growth of MAP and examined users' experiences with the open networking system. The report indicates that to date, MAP has not been widely implemented.

"Yankee Group surveys indicate that less than 1% of all U.S. industrial sites have installed a MAP network," said Keith Belton, director of The Yankee Group's Manufacturing Automation Planning Service, which authored the report. "Although more users now require MAP support from suppliers, the large-scale move to standards is still three years away."

MAP acceptance has been slow to date mainly because of the sluggish pace at which products based on the MAP 3.0 specification have come to market, Belton said. The slow emergence of such products is attributable to vendor confusion and wariness surrounding the upgrading of the MAP specification from Version 2.1 to Version 3.0.

Last year, many users reevaluated planned MAP purchases because of concerns about product availability, Belton said. Many projects that would have been based on MAP were too important to be delayed, and users opted for proprietary networking products instead.

The report stated that "a clear majority of users had not planned on buying anything other than fully specified MAP Version 3.0."

The Yankee Group estimates that the 1989 market for MAP-based offerings and related services will be about $25 million. It also expects the market to grow by more than 30%, to $36 million by 1990, when about 12 vendors will be selling fully specified MAP 3.0 products. Much of that growth will be what Belton referred to as "quiet growth," which includes sales of existing network products with MAP functionality built into them.

The report said availability of products supporting the Manufacturing Message Specification, a MAP Layer 7 application that

(continued on page 10)

INDUSTRY BRIEFS

Four former **Avanti Communications Corp.** executives have reunited as the senior management team of a network start-up company called **Promptus Communications, Inc.** in Portsmouth, R.I.

The new company plans to provide products that will let users link local networks and voice communications equipment to wide-area networks using new and emerging digital services, including Integrated Services Digital Network offerings.

The company was formed by a group of investors led by Aurelio Lucci, the founder and a former president and chief executive officer of Avanti.

Other members of the Promptus management team include: Gary Sapp, vice-president of sales and marketing and formerly vice-president of sales and service at Avanti; Paul Fredette, vice-president of research and development and formerly vice-president and chief technical officer at Avanti; and James Dolce, vice-president of engineering and formerly director of systems engineering at Avanti.

3Com Corp. last week announced the opening of offices in northern Europe, Asia and the Pacific Rim to provide local support for its local network customers. The offices — **3Com Nordic** in Stockholm, Sweden, **3Com Australia-New Zealand Area** in Sydney, Australia, and **3Com Asia** in Hong Kong — centralize sales, service and marketing operations and give users fast access to locally based 3Com representatives.

Sun Microsystems, Inc. last week announced it will team

(continued on page 10)

OSI/Network Management Forum documents

Released documents

Protocol Specification:
Released January 1989. Defines protocol details not specified in International Standards Organization standards to aid vendors in building net management systems that will interoperate in a multivendor network; also known as implementors profile.

Applications Services Specification:
Released June 1989. Specifies general-purpose network management messages that can be exchanged among multivendor net management systems, including alarm reporting and status information on managed objects.

Upcoming documents

Object Specification Framework:
Due later this month. Aids vendors in specifying objects that are to be managed through the network management systems.

OSI/NMF Architecture Document:
Due in November. Provides a general framework for existing and future OSI/NMF documents; tells vendors where the forum's standard interface can be used.

SOURCE: OSI/NMF ARCHITECTURE TEAM, BERNAROSVILLE, N.J.
GRAPHIC BY SUSAN J. CHAMPENY

OSI/NMF may win over IBM and DEC

Open net management group works to resolve concerns of firms that may be key to success.

By Gail Runnoe
Washington Correspondent

BERNARDSVILLE, N.J. — IBM and Digital Equipment Corp. may soon join the OSI/Network Management Forum (NMF), as issues that concerned the vendors are nearing resolution, according to a top official of the group.

Bringing IBM and DEC into its fold would be a major achievement for the group, which observers say has already made significant progress toward its goal of establishing a set of specifications — known as a profile — that will allow network management systems from different vendors to interoperate. The OSI/NMF profile will be based on Open Systems Interconnection standards.

OSI/NMF's John Miller

OSI/NMF has already released two documents that define protocol details and message specifications (see graphic, this page).

The group was formed in July 1988 by a consortium of eight vendors to accelerate the use of emerging OSI net management standards. Today, the group boasts a membership of more than 70 companies from 12 countries.

The forum has courted IBM and DEC since its formation. But the two companies passed on membership because they feared the forum's efforts would overlap with work being done by other OSI groups they supported, such as the Corporation for Open Systems International (COS).

A spokesman for IBM said the company was "concerned that there were a number of groups going down the same road." Before joining the forum, he said, IBM wanted to see greater communication between the forum and other standards groups and greater user involvement.

In recent months, the OSI/NMF has taken steps to address these concerns. Last spring, the forum formed an alliance with COS and the Brussels-based Standards Promotion and Application Group (SPAG), whereby the three agreed to pool their resources to solve OSI network management issues ("OSI groups team in net mgmt. effort," *NW,* May 22).

John Miller, the forum's president, said cooperation with COS and SPAG "gives the forum international alignment . . . and will definitely make the forum's [profile] stronger."

To increase user input, the forum began a pilot meeting program in July called the Presidents' Roundtable. User companies are invited to the roundtables to share their views on where the forum is going and what they would like to see the group accomplish.

Miller, also director of new services development and network management at AT&T, said, "We realize users are not going to invest the same resources [as vendors], yet they want to have influence."

The roundtables should "make it easy for end users to know what's going on and give

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OSI/NMF may win over IBM and DEC

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their input,'' he added.

IBM said its lawyers are currently working with OSI/NMF to fine-tune some unspecified language in the group's bylaws that the company found objectionable. The IBM spokesman said, "Once these concerns are resolved, IBM will become a member of the forum.''

Ian Sugarbroad, external relations director at the forum and vice-president of network systems at Northern Telecom, Inc., said IBM's membership will give "a tremendous boost to [the forum's] technical resources'' and will help the forum pull in new members that have been sitting on the sidelines waiting for IBM to act.

Sugarbroad also said DEC is very close to joining the forum.

A DEC spokeswoman said the company has submitted a list of concerns regarding forum bylaws on intellectual property rights. "If these issues are resolved, there's no reason why Digital shouldn't join,'' she said.

Member companies put both time and money into the forum. Voting members pay annual dues of $50,000, while associate members pay $10,000 annually. Since the forum does not maintain an in-house staff, members also donate personnel to accomplish the forum's technical work.

Frank Dzubeck, president and chief executive officer of Communications Network Architects, Inc., a Washington, D.C.-based consulting firm, said, "Getting the major players to the table is a much more significant event than getting the [specification] documents out. If these players weren't there, the documents would be impotent.''

Dzubeck said that adding IBM and DEC is critical for the forum. "The majority of computers installed today belong to DEC and IBM. The forum cannot afford to be aloof from that,'' he said.

Miller said the forum's goal is to provide a complete interoperability profile to which vendors can build products by the end of next year.

So far, everything is on schedule. "We're certain to see some products by the end of 1990," he said. "This will have a significant impact on customers,'' who will be able to use the forum specifications as a procurement standard.

Study details reasons for slow acceptance

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enables communications between devices on a factory network, could also provide a boost to MAP sales.

The Yankee Group report explored three MAP user case studies.

"MAP success stories will be important in making believers of other users thinking of investing in MAP,'' Belton said.

One case is that of the Aluminum Co. of America (ALCOA), which implemented MAP at an aluminum processing plant in Alcoa, Tenn. ALCOA installed a 30-node MAP 2.1 network that was estimated to be half the cost of a proprietary network after factoring in the hardware and software development costs that would have been incurred with a proprietary net.

The MAP network has allowed ALCOA to move information about materials processed at the facility more quickly and efficiently by letting operators communicate with multiple devices from a single terminal. ALCOA plans to upgrade to MAP 3.0 as more products become available.

The study also discussed a unique MAP installation at Southern California Edison Co., a Rosemead, Calif.-based public utility. The net supports a "peaker unit,'' a system for rapidly producing power for peak electricity demand.

Belton said Southern California Edison's MAP efforts could provide a boost to MAP's acceptance in the utility industry. But those who worked on the project said they now have "reservations'' about MAP.

"The peaker system works well, but the MAP portion of the network has been a problem,'' said Michael Baghdadi, project engineer for the network. "We were told MAP was what the world was coming to, but we're not so sure [now]. We've had problems interfacing devices on the MAP network with our programmable logic controllers.''

The survey also focused on The Boeing Co. in Seattle. Boeing is installing an Open Systems Interconnection-based corporate backbone network but chose not to implement MAP at a new sheet metal production facility because of a lack of available MAP 3.0-based products.

Boeing, like other members of the aerospace industry, is a longtime supporter of MAP and OSI. So it came as a surprise in March when Boeing awarded Digital Equipment Corp. a contract to build a DECnet network for the sheet metal facility in Auburn, Wash. The Yankee Group called the Boeing decision "a blow to MAP advocates in the aerospace industry.''

Industry Briefs

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up with Alameda, Calif.-based **Relational Technology, Inc.** to jointly engineer and market Unix-based products.

Relational Technology, whose primary product is the Ingres Relational Data Base Management System, will work closely with Sun to develop and enhance products for mutual and prospective customers. They will conduct joint sales presentations, provide each other with marketing support, jointly participate in trade shows and at users group meetings, and exchange sales and technical training.

The two companies will also conduct joint engineering and testing efforts to ensure that Ingres and other Relational Technology networking software run optimally on all Sun workstations.

So much hangs in the balance.

In this business, you can't afford surprises.

Meet Colleen Auchter. Student balloon pilot and Telecommunications Manager for Wang Financial Information Services.

If there's one thing Colleen has learned from her ballooning experience it's this: Be prepared for anything. Anticipate the unexpected. Because when you're thousands of feet in the air, you simply can't afford any surprises. You have to be able to rely on your decision-making skills . . . and your equipment.

The same holds true in Colleen's job at Wang Financial. The decisions she makes in selecting a private-line vendor are absolutely critical. Especially when you consider that Wang Financial uses private lines to supply money managers, banks and brokers with real-time stock market information. At any given moment, vital information that translates into multimillion-dollar transactions is crossing the lines through Wang Financial's SHARK® service. And if there's an interruption in transmission . . . well, that's serious trouble.

Obviously Wang Financial's customers demand consistently reliable service. Wang Financial, in turn, demands the same from **Williams Telecommunications Group (WTG)**. And gets it.

''These circuits are our lifeline. Our business depends on accurate, real-time information,'' Colleen explains. ''We have to go with reliable vendors. And WTG has proven reliability.''

The fact is, no other company sets higher standards for availability than WTG. But in Wang Financial's business, where data transmission is critical, they must take every precaution. And that means back-up systems. Just in case. So Colleen counts on WTG to provide Wang Financial with route diversity as well.

''Buying multiple circuits from WTG is efficient and economical,'' Colleen says. ''WTG has the route diversity Wang Financial needs.''

So if you're still up in the air about which telecommunications vendor to choose, call WTG at 1-800-642-2299, or your local WTG sales office, and ask about our new route diversity offering for your voice, data, or video private-line services. No other company gives you a higher level of service.

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TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Ameritech Mobile Communications, the largest cellular carrier in the Midwest, recently signed its 200,000th subscriber. The company began offering cellular service in Chicago in 1983 and now serves 22 metropolitan areas in five states.

Carrier Watch

AT&T last week introduced a billing service designed for customers whose employees use the carrier's telephone calling cards.

AT&T Card Execu-Bill offers a variety of billing and reporting options, summary billing capabilities, improved administration of corporate card programs and better fraud control. Execu-Bill service provides management reports to simplify card administration and monitor charges, including reports of active cardholders and card numbers, and summaries of usage by department or subgroup.

Execu-Bill service customers can have bills sent to their company's headquarters, individual cardholders, individual business units, departments or branch offices. Customers can request the calling data be delivered on paper or magnetic tape for further analysis, according to an AT&T spokesman.

Users can also mix and match billing and reporting options. For example, one customer might want summary statements of usage at headquarters and regional sales offices for chargeback purposes, with bills for payment issued to individual cardholders.

The onetime setup charge, which ranges from $1,000 to $2,500, will be waived for new customers until Dec. 31. A one-year term that offers a 50% discount on monthly basic service is available, as well as a two-year plan that provides free basic service.

MBG bill analysis software isolates Tariff 12 glitches

Pack shaves $250,000 from Ford's Tariff 12 bill.

By Jim Brown
Senior Editor

DEARBORN, Mich. — Ford Motor Co. is using a custom billing and traffic analysis package that helps the automaker detect errors in its Tariff 12 net bills and eliminate underutilized facilities.

Developed by MBG Associates, Ltd., the $25,000 MBG Tariff 12 Software has helped Ford trim its Tariff 12 costs by $250,000 since it began using the package in May 1988, according to Michael Greenspan, president of MBG Associates.

Ford, which has a five-year Tariff 12 contract worth a total of at least $87 million, declined to reveal the actual amount of its savings but said it is happy with the product. "The package is really doing the job," said Jim Soma, manager of telecommunications services at Ford.

In addition to spotting billing errors, the software helps Ford analyze traffic patterns and redesign the network to eliminate unneeded lines. It also enables Ford to generate reports used in billing sites for services.

MBG Tariff 12 Software runs on an IBM mainframe in Ford's data center here. The package includes a network design data base detailing the number of circuits in the Ford network and how they are routed. The package also maintains rate and distance tables that detail how each call should be billed.

When negotiating its Tariff 12 network, Ford required AT&T to consolidate all charges into a single, customized monthly bill. That bill is itemized to show usage in different mileage bands as well as detailed billing information about each call carried over private and public network facilities, said Wes Knight, supervisor of net administration at Ford.

"We sat down with AT&T originally and said this is how we want it," Knight said. "We kind of took a skeleton from that point and just kept building. In fact, it's not done yet."

The single bill replaces the multiple monthly bills Ford received from AT&T as an Enhanced Private Switched Communications Service (EPSCS) user. Ford replaced its EPSCS network with the Tariff 12 net last year.

Along with its monthly Tariff 12 bill, Ford obtains a tape from AT&T that contains call detail records that are loaded into the mainframe. MBG Tariff 12 Software filters the call detail records looking for duplicate charges, questionable charges and errors in AT&T's network design data base and rate table. The software also flags sites that have exceeded their average costs per minute of service.

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WASHINGTON UPDATE

BY ANITA TAFF

AT&T vs. US Sprint. AT&T last week came under fire again from rivals who claim the long-distance carrier has recently undertaken illegal marketing activities. US Sprint Communications Co. and the Independent Data Communications Manufacturers Association (IDCMA) charged AT&T with violating the Federal Communications Commission's Second Computer Inquiry, which prohibits offering customer premises equipment as an inducement to purchase transmission services.

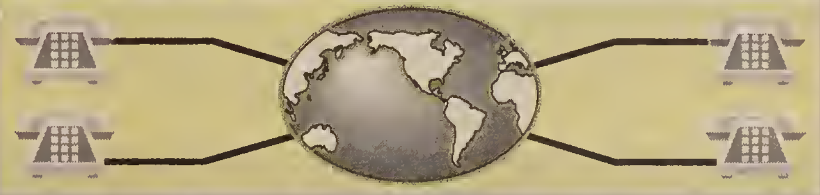
US Sprint filed a complaint with the FCC alleging that AT&T won a contract to provide Megacom service to the University of Nevada at Las Vegas by offering to sell the school a D-4 channel bank worth over $15,000 for about $600. About half the price reduction resulted from an equipment promotion that waived the installation charges for D-4 channel banks, and the remainder came from an AT&T promotion offering customers a $7,500 credit for subscribing to a Megacom contract. Such an offer violates Computer II rules, US Sprint said, adding that it was evident AT&T was using equipment as an inducement for a customer to buy regulated transmission services.

IDCMA's complaint stems from a series of recent AT&T advertisements that allegedly imply customers will get higher transmission quality if they use AT&T's data communications equipment than if they use equipment from another vendor.

AT&T has 30 days to respond to the complaints.

Worldwide automatic call distributor sales outlook

Year	Agent stations	Revenues (in millions of dollars)	Revenue growth rate
1988	488,800	$908	NA
1989	642,500	$1,077	18.7%
1990	797,100	$1,223	13.5%
1991	947,700	$1,345	10.0%
1992	1,079,700	$1,430	6.3%



NA = Not applicable

SOURCE: MARKET INTELLIGENCE RESEARCH CO., MOUNTAIN VIEW, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

Industry waits for Sikes' input on ONA

Service unbundling, cost-based pricing could be the key to network architecture's success.

By Anita Taff
Washington Bureau Chief

With the Federal Communications Commission's Open Network Architecture (ONA) plan at a crossroads, supporters and opponents of ONA are looking to new FCC Chairman Alfred Sikes for guidance.

In his previous role as head of the National Telecommunications and Information Administration (NTIA), Sikes was all for using ONA to bring advanced services to consumers and businesses. But he has not commented publicly on the plans since taking the top slot at the FCC.

Sources point out, however, that Sikes criticized the ONA plans submitted by the regional Bell holding companies while he headed up the NTIA. Two areas he singled out as necessary to the success of ONA were unbundling of service elements and cost-based pricing, both of which are still being debated.

ONA was devised to spur the development of advanced telecommunications services by requiring local carriers to offer competing service providers access to telephone company services at the same cost.

Under ONA, local carriers will provide transmission services, such as voice-grade lines, as basic service arrangements (BSA). They will also provide advanced capabilities, such as call forwarding, as basic service elements (BSE).

Although there is still debate over whether the unbundling and cost-based pricing goals can be accomplished with the plans the RBHCs have filed, many users and enhanced service providers claimed in recent filings that one of the most critical obstacles facing ONA may be tariffing.

The FCC initiated a proceeding early this year to establish how BSAs and BSEs should be tariffed and suggested that RBHCs be required to offer both ONA elements under federal tariff. This raised fears that providers of enhanced services and end users purchasing ONA services might be subject to federal access charges.

Although the FCC said enhanced service providers and end users would still be allowed to purchase BSAs through state tariff, thereby avoiding federal access charges, many observers say they are still concerned. They say the FCC might require enhanced service providers to use federally tariffed transmission services to purchase federally tariffed BSEs.

> Many users claimed that one of the most critical obstacles facing ONA may be tariffing.

▲▲▲

This would leave users with a "Hobson's Choice" of either foregoing the benefits of advanced ONA capabilities or being subjected to dramatic increases in telecommunications costs, according to a joint filing from the Coalition of Open Network Architecture Parties and the Ad Hoc

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City buys new Definity PBX, junks Dimension

By Bob Wallace
Senior Editor

BREA, Calif. — The city of Brea, the first government agency to purchase an AT&T Definity 75/85 Communications System Generic 1, will use the new switch to replace an aging Dimension PBX and provide dial-in information services to the community.

The city picked the $200,000 AT&T switch, which was packaged with an integrated Audix voice-messaging system, an automated attendant and 240 telephones, over private branch exchange offerings from IBM/Rolm Systems Division, Northern Telecom, Inc., Siemens Information Systems, Inc. and Harris Corp.

The Definity Generic 1, which will be installed this fall, will replace an AT&T Dimension 400 PBX. "We're the first agency to get a Definity, but we were probably the last to get the Dimension," said Richard Fassione, manager of information services for the city.

Announced six months ago, the Definity Generic 1 can be configured to serve up to 1,600 lines. Brea's Definity Generic 1 will support 250 stations.

The city will use the switch's integrated automated attendant feature and its stand-alone voice mail system in conjunction with a new published telephone number to provide informational services to the community, Fassione said.

Callers dialing one of the numbers will be greeted by the automated attendant, which will tell the caller to press 1 for help wanted information, 2 for building permit data or 3 for directions to city hall. After the caller makes a selection, the call will be passed to the appropriate voice mailbox.

The voice-messaging system also promises benefits to city employees who work in the field by enabling them to call in to their voice mailboxes to retrieve, leave or forward messages, Fassione said.

Police officers and firefighters will be able to use Audix's broadcast feature to leave one message for multiple subscribers during emergencies or disasters.

AT&T underbid 11 competitors to land the contract. IBM/Rolm bid a 9751 CBX; Centel Business Systems and General Telephone Co. of California's equipment sales arm both proposed a Northern Telecom SL-1; Tel-Plus Communications, Inc. bid a Siemens Saturn; and Harris bid a 20-20 PBX.

Advanced Network Design, a consulting and network optimization firm based in Garden Grove, Calif., developed the request for proposal, analyzed and evaluated vendor responses and recommended the city stay with AT&T.

"AT&T proposed the most attractive package at the best price. They were really interested in retaining us as a client and were extremely aggressive in winning our business," Fassione said. The city opted to purchase the Definity Generic 1 after the six-year lease on its Dimension expired.

STARTING SEPTEMBER 25

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For details on *Network World's* new FAXNeT inquiry service, and the September 25 inaugural issue, FAX Paul McPherson at 508-879-3167.

September 25 issue closes September 13.

NETWORK WORLD
An IDG Publication

Bill analysis software isolates glitches

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Once calls have been filtered, the software prepares a report in a format identical to AT&T's bill.

"We compare that against what our friends from AT&T charge," Soma explained. If the two do not match, Ford delves deeper into the call detail records to locate errors.

According to Greenspan, MBG Tariff 12 Software has yet to detect a major glitch in the AT&T Tariff 12 billing system. "There are no long-term problems."

Soma, however, said Ford is detecting more errors in Tariff 12 billing than it found in its EPSCS billing. He said this is largely because the single bill Ford gets under Tariff 12 makes finding errors easier than examining the multiple bills Ford got each month for its EPSCS usage.

While MBG Tariff 12 Software performs many of the same functions as existing bill analysis packages, it has been designed to utilize the extra call detail data that Tariff 12 billing provides to users, Greenspan said. For example, billing data allows Ford to determine how international calls were routed. This information was unavailable in EPSCS billing.

But Tariff 12 billing information lacks some items previously available with EPSCS billing such as trunk line usage. "I used to be able to say to Ford, on a daily basis, that these four circuits out of 4,000 didn't carry any traffic at all," Greenspan said. "Now I can't do that."

Industry waits for Sikes' input on ONA

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Telecommunications Users Committee.

The rules governing how ONA services are priced and tariffed will determine whether the proceeding has a chance of success, according to both groups.

"The manner in which [those questions] are resolved will determine, in substantial part, whether ONA will realize its initial promise or become a regulatory charade," the groups said in their filing.

Other users groups, such as the International Communications Association (ICA), also contend that federal tariffing of ONA elements will lead to grossly overpriced service. One reason it can be assumed that federal tariffs might lead to non-cost-based pricing, according to the ICA, is that neither of the current federal access tariffs — switched or special access — are based solely on cost.

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "HLLAPI is living a lot longer than it should have. Anybody who's thinking of building new applications around it is clearly making a mistake."

Joe Mohen
President
Teleprocessing Connection, Inc.
Garden City, N.Y.

Data Packets

Racal-Milgo and **Advanced Telecommunications Corp. (ATC),** a domestic and international long-distance carrier, last week announced that they have formed a strategic alliance to supply Racal-Milgo's Omnimux 7000 T-1 multiplexer to ATC customers.

At last week's Southeastern Telecommunications Association conference in Nashville, the companies said they will offer substantial discounts on equipment and services. Packages will include a purchase plan as well as one-, two-, three- or five-year lease programs. A lease to purchase option will also be available.

The **AR Division of Telenex Corp.** recently announced plans to support AT&T's Unified Network Management Architecture. The AR Division, a supplier of diagnostic test equipment and network control systems, will develop an interface between its NTS 4000 Network Restoration, Test and Management System and the AT&T Accumaster Integrator.

NTS 4000 is a fault management system that helps network operators identify faults, restore service, diagnose problems and track results in multivendor networks.

The Accumaster Integrator interface will be available in the second half of 1990. Pricing has not been determined.

For more information, contact the AR Division at 7401 Boston Blvd., Springfield, Va. 22153; (703) 644-9190. ◼

Northern Trust banks on fiber-optic T-1 backbone

Net saves a bundle, supports new functions.

By Bob Brown
Senior Editor

CHICAGO — Network executives at Northern Trust Co. are glad they didn't go with their first instinct when upgrading the company's corporate data communications network here.

By building a fiber-optic T-1 backbone instead of adding 56K bit/sec links to its existing net as originally planned, the bank has saved about $300,000 a year on line costs and greatly expanded its network capabilities.

Northern Trust's original network consisted of an IBM 3090 at the company's data center here. That net was tied to IBM 3270 terminal equipment in four Chicago-area offices with dedicated 56K bit/sec links, according to John Archer, the company's vice-president of technical services.

When the bank installed a cluster of six Digital Equipment Corp. minicomputers, it sent out a request for proposal seeking equipment to use with the 56K bit/sec links it intended to install to link the remote offices and the DEC cluster.

The 56K bit/sec lines used to support the IBM gear had served Northern Trust well. Therefore, the company figured they would be ideal for the DEC net as well, Archer said. The DEC computers, which support customer accounts, are collocated with the IBM 3090, which supports all back-office accounting.

Alternative plan

Infotron Systems Corp., one of the companies responding to Northern Trust's RFP, suggested an alternative plan.

Infotron advised the bank to install a mesh backbone net of 1.544M bit/sec NovaLink Service fiber lines from Illinois Bell Telephone Co. The backbone would

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COMSAT woos customers with discount contracts

By Jim Brown
Senior Editor

WASHINGTON, D.C. — Despite competition from new transoceanic fiber-optic undersea cables, Communications Satellite Corp.'s satellite services are being used by a growing number of multinational companies building private data networks.

International data traffic accounts for only 10% of COMSAT's traffic, but it is growing twice as fast as COMSAT's traditional switched voice traffic, said Bruce Crockett, president of COMSAT's World Systems Division.

COMSAT, the U.S. representative to the International Telecommunications Satellite Organization, provides C- and Ku-band satellite services in conjunction with its INTELSAT partners around the world.

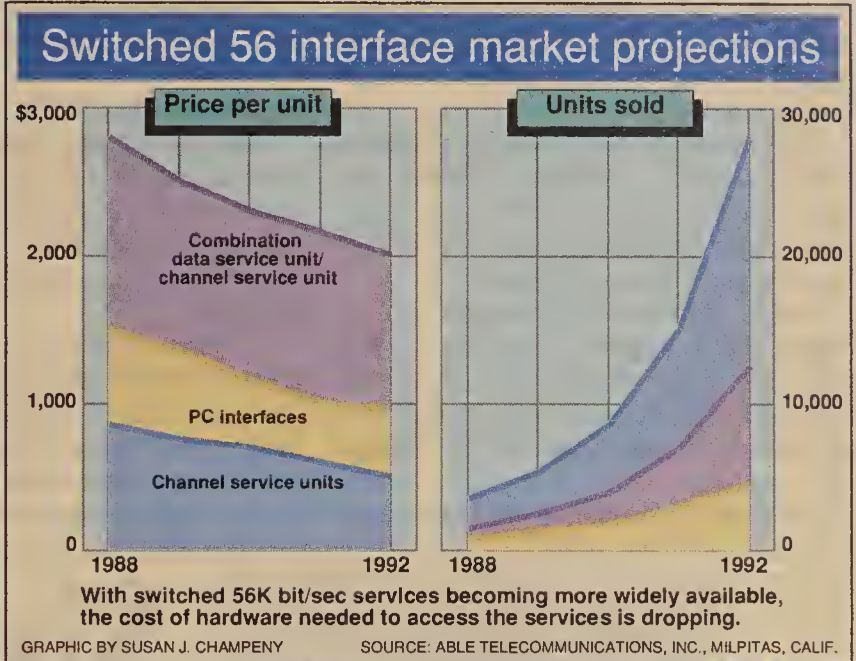
COMSAT has traditionally provided international switched voice services to telecommunications carriers and broadcast services to television networks. Carriers resell COMSAT's voice services, while broadcasters such as NBC rely on COMSAT to distribute television programming to affiliates.

Three years ago, COMSAT began offering its International Business Services (IBS), which let users lease circuits ranging in speed from 64K bit/sec to T-1. That business now accounts for 30% of COMSAT's revenues.

Until new satellites are launched, it is unclear how much more data traffic growth COMSAT can accommodate because it is running out of satellite capacity. COMSAT also faces stiffer competition from fiber cable, which has capacity to spare and is causing a decline in the cost of international service rates ("Undersea fiber cables to herald low int'l rates," *NW,* Aug. 28).

To ease the capacity crunch, INTELSAT plans to launch at least two INTELSAT VI satellites made by Hughes Aircraft Co. over the next 12 months, Crockett said. The consortium has already begun designing the INTELSAT VII, which will be built by Ford Aerospace Corp. and pressed into service in the early 1990s.

In the meantime, COMSAT has begun to offer long-term deals with aggressive pricing discounts in an effort to keep current IBS customers from diverting traffic to fiber cables that cross the Atlantic and Pacific oceans. The discounts, which offer users savings of up to 30% off monthly transmission rates, were so attractive that the number of IBS customers under long-term contracts has risen from 16% to 40% since the Trans-Atlantic Trunk-8 cable became operational. ◼



Switched 56 interface market projections

With switched 56K bit/sec services becoming more widely available, the cost of hardware needed to access the services is dropping.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: ABLE TELECOMMUNICATIONS, INC., MILPITAS, CALIF.

Intel to add software to bolster Fastpath

Subsidiary Jupiter Technologies will adapt processor software for mainframe link product.

By Jim Brown
Senior Editor

WALTHAM, Mass. — Intel Corp.'s Jupiter Technologies, Inc. subsidiary recently announced it will develop software for Intel's Fastpath to expand the capabilities of the IBM mainframe connectivity product.

Jupiter will develop for Fastpath a version of its Softlink operating system, which runs on Jupiter's System 100 and System 1000 communications processors. Equipped with Softlink, Fastpath will be able to support Jupiter communications applications called Softblocks.

Softblock applications enable the System 100 and System 1000 to support functions such as protocol conversion, data switching, multiplexing and packet assembly/disassembly. One Softblock application, for example, supports as many as 400 different asynchronous terminal models and enables a terminal made by one vendor to access processors made by another.

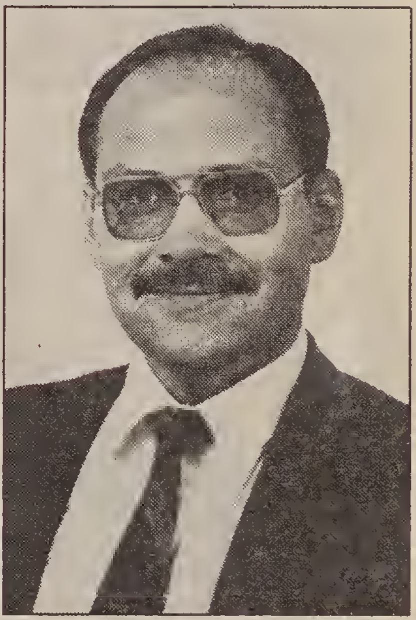
The likely outcome

Analysts say merging Jupiter's software with Intel's Fastpath will likely result in a Fastpath product capable of connecting local networks based on Transmission Control Protocol/Internet Protocol and wide-area networks — supporting High-Level Data Link Control and IBM's Binary Synchronous Communications protocols — to IBM hosts at channel speeds.

By converting TCP/IP, HDLC and BSC protocols to IBM's mainframe channel protocol, the enhanced Fastpath product would give users high-speed access to IBM mainframes without the need for a traditional front-end processor.

Enabling Fastpath to support protocol conversion in addition to mainframe access functions "is going to redefine the front-end processor," said Doug Gold, manager of communications research at Framingham, Mass.-based International Data Corp.

Fastpath attaches to the channel of IBM mainframes and currently enables IBM cluster controllers and computers such as IBM's 9370 to access mainframe resources at channel speeds up to 3M byte/sec.



Jupiter's James Flach

Jupiter, which Intel acquired last June, is also slated to develop a version of Softlink that will enable IBM Personal Computers and other Intel-based computers to run Softblock applications, said Jupiter President James Flach.

"The technology we embody

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Northern Trust banks on T-1 backbone

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be controlled by seven Infotron Network Exchange (NX) 4600 T-1 multiplexers, two of which would be located at the data center. Several T-1 links were to serve as backup circuits.

The configuration, which Northern Trust eventually adopted, allowed the bank to run all of its data traffic over a single network instead of the two networks it had originally planned to install.

It also proved to be extremely cost-effective. According to Archer, the 12 T-1 links the bank installed cost about the same as 24 56K bit/sec dedicated links but supported the equivalent of 288 56K bit/sec circuits.

While the bank did not need that much capacity, Archer said he could justify the T-1 backbone with his current traffic and have plenty of capacity for growth.

Newfound flexibility

Bank employees have found that the combination of the high-speed fiber links and the NX4600s provides the flexibility to link any asynchronous terminal to any host, opening up new opportunities for applications.

The fiber links also provide "greatly improved transmission quality" compared to the copper-based 56K bit/sec links the bank formerly used between major network nodes, Archer said.

Data from outlying Northern Trust offices, which are situated as far away as San Francisco and London, is fed into the backbone over an assortment of 56K and 9.6K bit/sec links. Five Infotron 992 Network Processor statistical multiplexers are used for switching data at some of these Northern Trust sites.

The network has grown to the point where Northern Trust is now planning the installation of a 45M bit/sec T-3 link to a new facility where 2,500 of its employees are being transferred in mid-1990.

"I never imagined we'd be thinking about using a T-3 link," Archer said. "I think we had about 12 4.8K bit/sec lines running between two buildings when I started here."

A future consideration for the network is the migration of voice onto the backbone, he said. ☒

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SEPTEMBER 12 14 DALLAS INFOMART

Intel adds software to bolster Fastpath

continued from page 13

in Softlink is very similar to MS-DOS in the personal computing world," Flach said. "To be successful, we have to run Softlink on multiple microprocessor technologies."

Intel's financial and technological backing will help make the task of porting Jupiter's software to Fastpath and other Intel-based computers easier, Flach said.

It will also make it possible to broaden the number of computers capable of running Jupiter software. "It doesn't take a lot of imagination to see that we're going to be investing in a lot of additional hardware platforms in the not too distant future," he said.

To make it easier for Jupiter software to be ported to Fastpath, Intel shifted responsibility for the Fastpath product line to Jupiter.

Jupiter is also developing Digital Equipment Corp. DECnet-compatible software for Fastpath to enable it to act as a DECnet-to-SNA gateway, Flach said. This will position Jupiter to compete against Interlink Computer Sciences, Inc., which makes channel-attached DECnet-to-SNA gateways.

Jupiter's current products compete against general-purpose computers configured as communications processors, such as IBM's Series/1 and 9370, as well as DEC's MicroVAX and Tandem Computer, Inc.'s line of NonStop minicomputers.

While those systems can support protocol conversion and gateway functions, Flach said they cannot achieve the same performance as Jupiter's systems, which were designed specifically to support data communications processing tasks.

Unconvinced users

Although Jupiter has sold 200 of its System 1000s since 1987, the company has not met with tremendous success because it has had difficulty explaining to users precisely what its products are designed to do, according to Flach.

Analysts agreed. "They've had a very difficult time convincing people they have a legitimate product and a legitimate strategy," Gold said. "I think that is owed more to the complexity of the product than anything else."

To alleviate this problem, Flach said Jupiter will start selling Solution Sets, which are preconfigured hardware and software packages designed to meet specific communications needs.

Bundling Jupiter's Softlink and Softblocks with hardware to attack a specific problem will enable Jupiter to position its product according to the function performed by the Solution Set. For instance, a Solution Set designed to provide links between multiple local networks can be classified as a network gateway.

The company is currently marketing the product as a hardware unit that can be configured by end users to perform a variety of functions.

One Solution Set will enable Jupiter hardware to act as a data switch providing links between different networks. Softblock applications will provide the conversions needed to facilitate the connections.

Solution Sets drew praise from Gold. "I always thought that the greatest strength of the Jupiter product line was the flexibility of its Softblock architecture," he said. Bundling those Softblocks with hardware will go a long way in helping Jupiter better explain its products to users, he said. ☒

LOCAL NETWORKING

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Worth Noting

"End users are in a predicament. They're faced with confusing purchasing choices: OS/2 LAN Manager or NetWare 386? Do they want SQL Server? The level of complexity is slowing down purchasing decisions."

Mary McCaffrey
Financial analyst
C.J. Lawrence,
Morgan Grenfell, Inc.
New York

Netnotes

Thomas-Conrad Corp. will introduce an Arcnet interface board for Apple Computer, Inc.'s Macintosh II line of computers at the NetWorld '89 show next week in Dallas.

Thomas-Conrad is entering the Macintosh market with the ARC-CARD/NB, a 32-bit adapter that enables users to link Macintoshes over Arcnet networks. Arcnet offers 2.5M bit/sec speed and a maximum 20,000-ft. network span. It is a deterministic token-passing technology. The company said the interface card provides users with an alternative to Apple's LocalTalk network hardware.

The ARC-CARD/NB will be available in the fourth quarter. It is priced at $495, including NetWare drivers.

Thomas-Conrad is located at 1908-R Kramer Lane, Austin, Texas 78758, or call (512) 836-1935.

Lotus Development Corp. recently previewed a product that uses Quarterdeck Office Systems, Inc.'s Desqview to link Lotus 1-2-3 spreadsheets to the Dow Jones News Retrieval Service.

The product, dubbed Princeton, will be a Desqview application bundled with a subscription to the Dow Jones service. Princeton users will be able to log onto the news service as many as five times a day without incurring any access charge.

E-mail packs for the Mac

Company	Product	Shipment	Price
cc:Mail, Inc. Palo Alto, Calif.	cc:Mail	June 1989	$675 for 25-user version
CE Software, Inc. Des Moines, Iowa	QuickMail	March 1989	$400 for 10-user version
Microsoft Corp. Redmond, Wash.	Microsoft Mail 2.0	September 1989	$1,495 for 20-user version
The TOPS Division of Sun Microsystems, Inc. Alameda, Calif.	InBox	September 1989	Unannounced

GRAPHIC BY SUSAN J. CHAMPENY

Mac nets get slew of new E-mail functions

Vendors enhance existing packages and offer links to other electronic messaging systems.

By Sarah Vandershaf
West Coast Correspondent

Users of Apple Computer, Inc. Macintosh networks are getting an array of new messaging capabilities as vendors ship enhanced electronic mail packages and gateways that allow Mac users to exchange mail with users on other networks and processors.

E-mail vendors are building such capabilities as store-and-forward into their E-mail packages and forging ties to IBM's Professional Office System (PROFS), Digital Equipment Corp.'s All-In-1, Wang Laboratories, Inc.'s Wang Office, as well as other high-end mail nets.

Analysts say the enhancements and gateway capabilities make Macintosh networks more attractive to businesses that wish to integrate Apple products into corporate nets.

Mail call

Microsoft Corp. plans to ship its enhanced Microsoft Mail Version 2.0 this month ("Microsoft enhances E-mail product for AppleTalk nets," *NW,* Aug. 14).

Microsoft added directory management and store-and-forward features to simplify the process of transmitting messages to one or more recipients.

Store-and-forward technology lets messages be stored in a sender's server when a recipient cannot be reached. The sending server then tries to deliver the message at varying intervals.

Although Microsoft Mail currently runs exclusively over AppleTalk networks, Microsoft is developing several gateways in conjunction with third-party vendors that will link the product with PROFS, DEC's VMSMail and X.400-based systems.

Microsoft Mail 2.0 software costs $395 for the server portion and $125 for each node. A 20-node package is available for Macintoshes for $1,495.

Later this month, The TOPS Division of Sun Microsystems, Inc. expects to begin shipments of InBox 2.0, an E-mail package that allows Macintosh, DOS and OS/2 computers to exchange messages and files over an AppleTalk network.

The software operates on personal computers running the TOPS 2.0 operating system. Pricing has not been announced.

In June, Palo Alto, Calif.-based cc:Mail, Inc. added a Macintosh version of its popular cc:Mail software for customers with both DOS-based personal computers and Macintoshes. The company claims to have 200,000 users of it E-mail software.

The Macintosh version of cc:Mail uses a distributed architecture in which a mail server is used to bridge Macintosh and DOS networks.

Through cc:Mail, users can ac-

(continued on page 48)

Macintosh mail gateways

Third-party gateways for Apple Computer, Inc. E-mail nets to host-based mail systems.

Alisa Systems, Inc.
AlisaMail
- Works with Microsoft Corp. Microsoft Mail, QuickMail
- Links to IBM PROFS; Digital Equipment Corp. VMSMail, All-In-1; X.400

Pacer Software, Inc.
Pacer Post
- Works with Microsoft Mail
- Links to PROFS, VMSMail, All-In-1, X.400

Soft-Switch, Inc.
SNADS Gateway
- Works with Microsoft Mail
- Links to PROFS; DISOSS; All-in-1; Wang Laboratories, Inc. Wang Office; Hewlett-Packard Co. HP Desk; X.400

StarNine Technologies, Inc.
Mail*Link SMTP
- Works with Microsoft Mail, QuickMail
- Links to any system based on the SMTP protocol

Banyan offers entry-level, 10-user version of VINES

VINES/386 Team targeted at small work groups.

By Susan Breidenbach
West Coast Bureau Chief

WESTBOROUGH, Mass. — Banyan Systems, Inc. last week released an entry-level, 10-user version of its VINES/386 network operating system.

VINES/386 Team is aimed at small work groups, a market segment traditionally dominated by Novell, Inc. and 3Com Corp. It has largely been ignored by Banyan, which has focused on large, enterprisewide internetworks.

At $2,495, Banyan's entry-level offering costs more than the eight-user version of Novell's NetWare ($1,895) and the 10-user release of 3Com's 3+Open LAN Manager ($1,495).

However, VINES/386 Team includes Banyan's StreetTalk global naming service, a facility the competing products do not have. StreetTalk eases net administration and simplifies access to resources on large internetworks. Until the end of November, the Team version will also include free copies of Banyan's VINES Network Mail and PC Network Printing options, ordinarily an additional $995 and $495, respectively.

PC Network Printing lets users on a VINES/386 Team net share up to 10 printers, with as many as six being attached to workstations, rather than a server.

Additionally, the entry-level product supports a variety of VINES/386's connectivity options, including 3270, asynchronous and X.25 links.

According to Mary Kirson, director of product marketing for Banyan, a primary target for VINES/386 Team is large customers that have a number of branch offices with only a handful of users. Such customers "need a lower price point" before they can be convinced to install VINES at these small remote sites, she said.

(continued on page 48)

Xerox unveils encryption device for Ethernet users

By Susan Breidenbach
West Coast Bureau Chief

MCLEAN, Va. — Xerox Corp.'s Integrated Systems Operations unit recently introduced an encryption device that enables users to send encrypted and unencrypted messages across an Ethernet local network.

The Xerox Encryption Unit (XEU) has been submitted to the federal government for approval as a Type 1 security device under the National Security Agency's (NSA) Commercial Security Endorsement Program (CCEP). Type 1 security is required for transmission of the government's most highly classified information.

According to Xerox, the XEU is the first product to provide this type of security for standard Ethernets. Until now, special — and sometimes isolated — networks were required for transmitting classified information.

"We foresee much wider applications for the many installed and commonly used Ethernet-type networks within the federal government and its contractors because those networks can now be made secure for classified information," said Jay Nussbaum, president of Integrated Systems Operations.

The XEU unit, a 3- by 10- by 12-in. box, is installed between the workstation and the network, with the cables from each plugging into it.

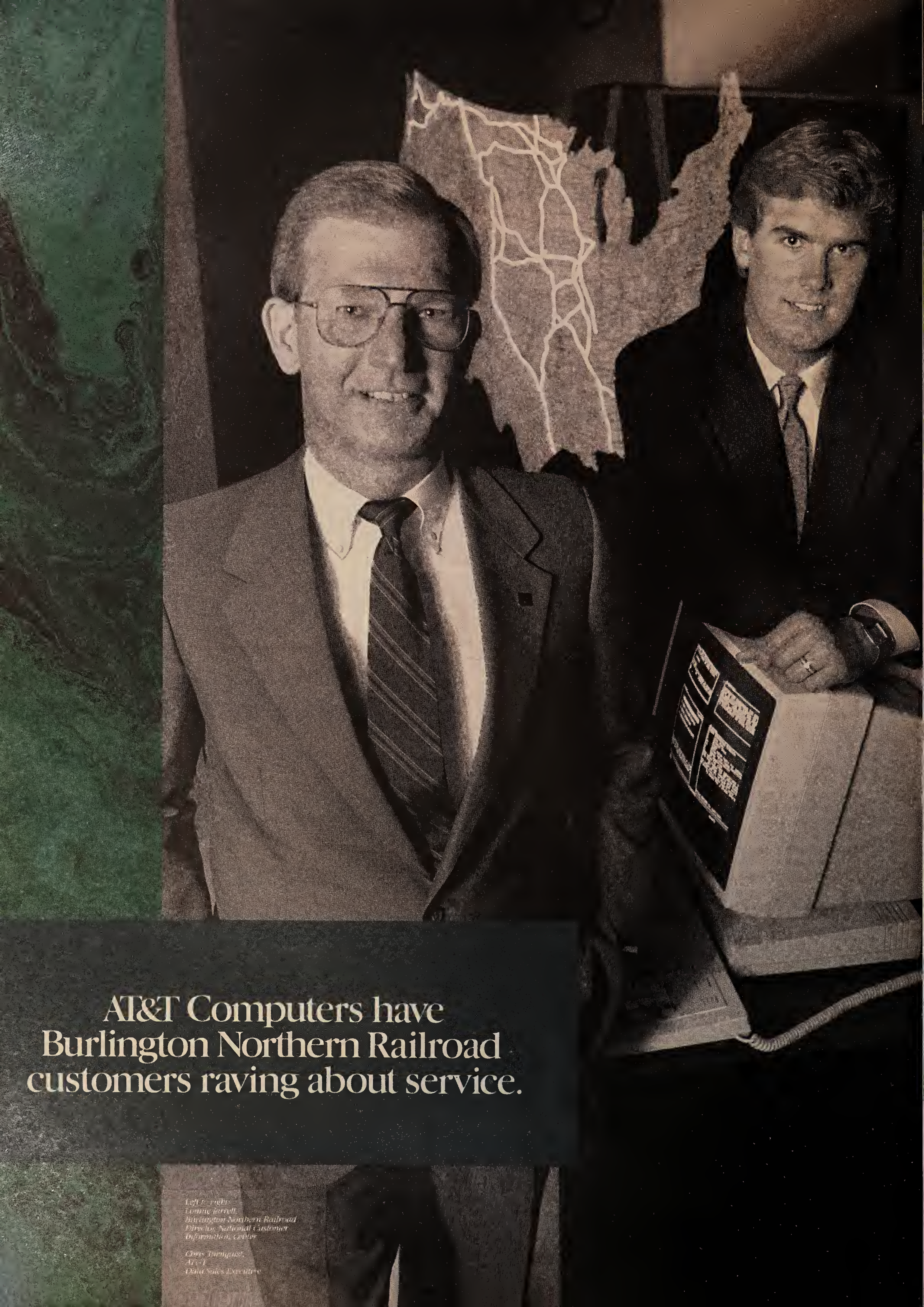
When transmitting or receiving classified information, the user activates the XEU by inserting an electronic Crypto Ignition Key into the front of the unit. The activated XEU encrypts data being sent from the workstation to the network and decrypts data destined for the workstation.

According to Xerox, the XEU uses government-supplied algorithms and key variables in the encrypting process. It is encased in an injection-molded plastic chassis that can only be accessed only with what Xerox described as an "unduplicatable" key.

Any attempt to tamper with the unit will be detected by special circuitry that erases all cryptographic information, while sounding an alarm and lighting a red light on the XEU.

The XEU uses an NSA-endorsed encryption microprocessor and other circuitry developed by Ultron Labs Corp. of San Jose, Calif.

The product is priced at $4,995 and is available now. The XEU must be endorsed by the NSA before it ships; Xerox said endorsement is expected in the fourth quarter.



AT&T Computers have Burlington Northern Railroad customers raving about service.

Left to right:
Lonnie Jarrell,
Burlington Northern Railroad
Director, National Customer
Information Center

Chris Turnquist,
AT&T
Data Sales Executive

Denver, Colorado
May 2, 1989

The Burlington Northern National TrackSmart* Center is getting rave reviews from its customers. And AT&T's distributed networked computer solution behind it is getting rave reviews from Burlington Northern. Burlington Northern's Lonnie Jarrell tells AT&T's Chris Turnquist why AT&T Computers provide a better way to serve customers of the longest railroad in the country.

Lonnie: We want to be known for superior customer service. So we planned proactive shipment monitoring through a new customer service concept—the National TrackSmart Center.

Chris: And better customer service means getting information to your customers, in *their* reporting format, as soon as your reps have it.

Lonnie: Exactly. All we had to do was listen to our customers to understand their transportation information needs. That was plenty of inspiration. We knew then that we needed a system that would let our reps instantly locate cars and report shipment status to customers immediately.

Chris: I remember when your reps could only handle one customer at a time. They had to query the mainframe database car by car. And *then* manually record their findings and send them out. Now each rep can handle up to ten customers, right?

Lonnie: Absolutely, plus the rep has more time to serve his customers better. Now they save time by tracking every car from *one* CRT. The AT&T 6500 Multifunction Communications System gives them multi-window access to two synchronous sessions on our host, as well as async access to the TrackSmart application and AT&T Mail. Both TrackSmart and AT&T Mail run concurrently on the AT&T 3B2/1000 Computer. So the reps get information the second they need it.

Chris: And you're able to tap information easily.

Lonnie: Right. Because you molded AT&T distributed networked computing to fit the Burlington Northern, rather than the other way around. You provide it all—computer networking systems and communications expertise. Plus you blend it all together with other systems better than any company I've ever seen.

Chris: I understand one customer wrote a BN rep promising him an official company ID naming him their Assistant Transportation Manager.

Lonnie: That's true. But you know, if we're going to be a partner to our customers, we have to be a partner with vendors who can take us in that direction.

The Burlington Northern Computer Solution

THE CHALLENGE:

Differentiate Burlington Northern as a superior provider of customer service.

THE SOLUTION:

A distributed networked computer solution integrating Burlington Northern's applications with a UNIX* System V-based Informix* 4GL database management package. An AT&T 3B2/1000 Computer is the gateway to the host for TrackSmart information. The AT&T 6500 Multifunction Communications System provides host access with four window functions appearing on AT&T 6539 displays. AT&T Mail sets up an E-mail link between reps and customers; AT&T Mail with Private Message Exchange/TERM is a private E-mail link between Burlington Northern reps and TrackSmart.

THE RESULTS:

The system increases the number of customers a representative services tenfold. Some customers have indicated TrackSmart saves them at least four hours daily.

Call your AT&T Account Executive, AT&T Authorized Value Added Reseller or 1 800 247-1212, Ext. 527.

Your Computing Systems and Networking Solutions Company

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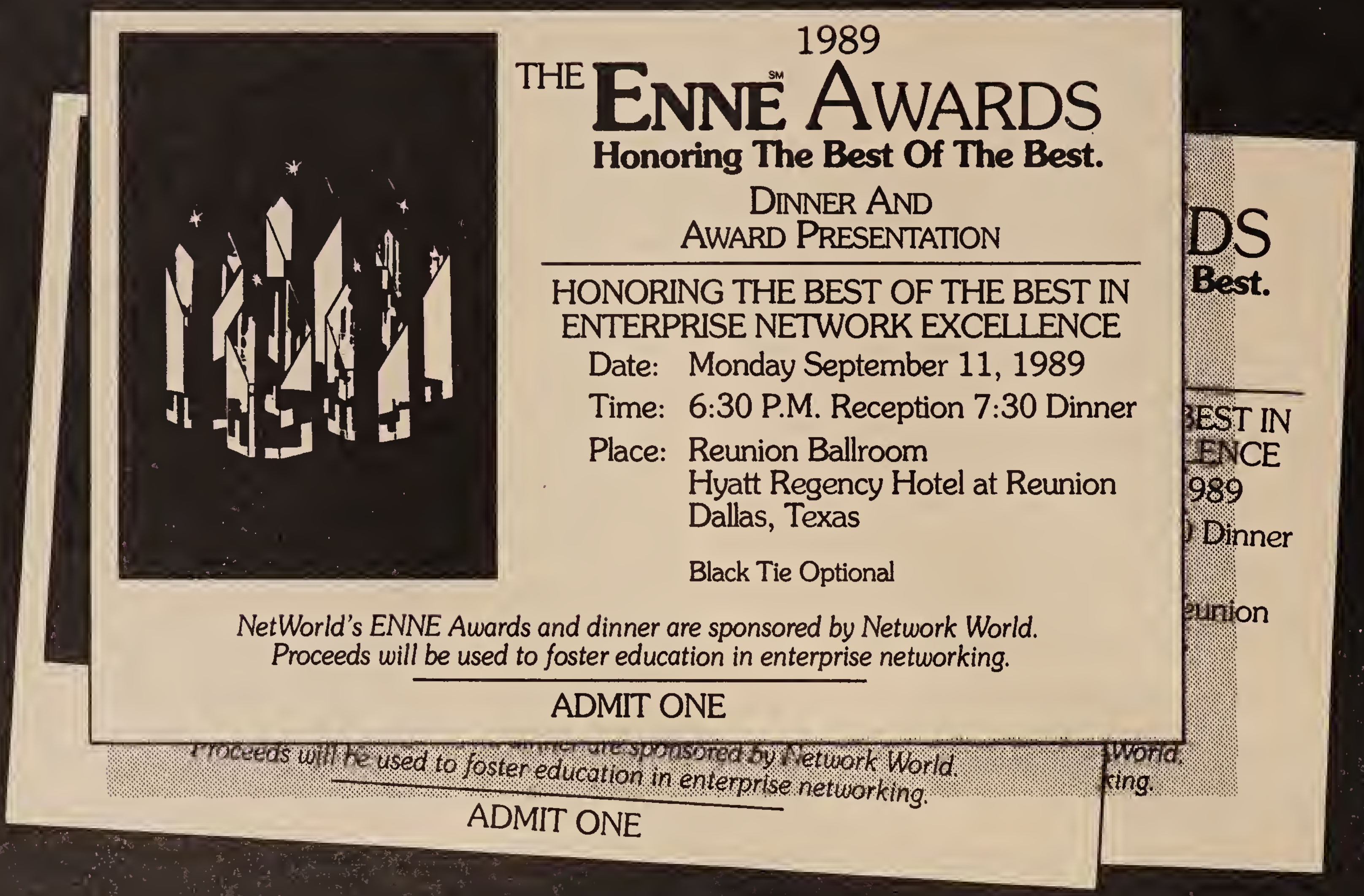

1989

THE ENNE℠ AWARDS

Honoring The Best Of The Best.

DINNER AND
AWARD PRESENTATION

HONORING THE BEST OF THE BEST IN
ENTERPRISE NETWORK EXCELLENCE

Date: Monday September 11, 1989
Time: 6:30 P.M. Reception 7:30 Dinner
Place: Reunion Ballroom
Hyatt Regency Hotel at Reunion
Dallas, Texas

Black Tie Optional

NetWorld's ENNE Awards and dinner are sponsored by Network World. Proceeds will be used to foster education in enterprise networking.

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In purchasing a ticket to the ENNE℠ Awards, you're doing more than gaining entry to a dinner.

You're gaining entry to a select group of companies able to mold the destiny of an industry.

Because, while the ENNE Awards are primarily designed to recognize achievement, they also recognize something else.

The fact that tomorrow's enterprise network will be determined by educational opportunities available today.

That's why all the proceeds from the ENNE Awards dinner will be channeled toward educational programs furthering the understanding and use of enterprise networking.

Your participation on September 11 will translate into opportunities for years to come.

And that's a ticket to a bright, shiny future.

RESERVE YOUR TICKETS TODAY!
The ENNE Awards Banquet will be held 6:30 P.M., Monday, September 11, 1989 in the Hyatt Regency Hotel at Reunion in Dallas, Texas during the NetWorld '89 Show.

Only 400 tickets are planned for sale.

For ticket information call
(212) 983-4965

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FIFTH ANNUAL

User Excellence Awards

Get in the running for Network World's User Excellence Awards

Network World believes networking can change the way organizations do business, helping them become more competitive, more productive and more responsive to opportunities and changing market forces. Through our annual User Excellence Awards, we honor users that have applied network technology to gain competitive advantages.

To help us determine how innovative your organization is in using network products and services, please complete the brief postage-paid questionnaire below and return it no later than Sept. 29. (If you need additional space, use the back of the form or type your responses on a separate sheet.) Your name, title, address and phone number must be included.

All User Excellence Award winners will be featured in the Dec. 18 issue of *Network World*. Awards will be presented at the Communication Networks conference in Washington D.C. in February 1990.

Remember, it's not how much you've spent on networking but what you've accomplished that counts. Good luck!

1 Name:
Title:
Company name:
Address:
Phone number:

2 Does your organization have a separate communications department with responsibility for both voice and data network expenditures? **YES/NO**

3 Is your network international in scope? **YES/NO**
If yes, how many countries does it encompass?

4 Please explain how networking has helped you to differentiate products and services from those of competitors or to launch new products and services.

5 Please explain how network technologies, such as EDI, have helped you build closer, more productive relationships with customers, suppliers or partners.

6 Does your network integrate multiple network architectures, such as IBM's SNA, DEC's DNA, TCP/IP, OSI and others? **YES/NO**
If yes, how is that being accomplished?

7 If you plan to implement ISDN, please explain why and how it will be done.

8 Does your company have a strategy for migrating to an integrated multimedia network that supports voice, data, image and video traffic? **YES/NO**
If yes, please explain.

9 What steps are you taking to contain communications costs?

10 What do you consider to be the most unique and innovative features of your network?

11 What was the single most important networking project your department undertook last year, and why was it important?

- STOP - HAVE YOU ANSWERED QUESTION 1?

NETWORK WORLD
The Newsweekly of User Networking Strategies

Has networking changed the way you do business?

Past User Excellence Award winners

1985	1986	1987	1988
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First Interstate Bancorp	First Wisconsin National Bank of Milwaukee	Midlantic Banks, Inc.	Bechtel Group, Inc.

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Comments:

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Dialogue

Will declining prices of international circuits affect your global network plans?

"It will make it easier for us to justify the decentralization of our corporate sites to new markets or pockets of technological expertise. However, the price of bandwidth is less a factor in positioning our offices overseas than actual business opportunity."

Rob Rich
Group telecommunications manager
General International Area
Digital Equipment Corp.
Maynard, Mass.

"Falling prices will enable us to spread into new geographical regions and provide more of our services and products via communications links.

"Declining rates will also enable us to design high-bandwidth digital networks in Europe. That's even more the case in the U.S., where prices are dropping faster than in Europe."

Allan Conner
President
DunsNet,
A Dunn & Bradstreet Co.
Wilton, Conn.

"Falling prices will [make] us reconsider linking our dealerships overseas with voice and data circuits. We are always looking for anything that will help us justify the costs of our network projects.

"Even if the price is right, however, the communications technology has to be approved by foreign PTT authorities, which isn't always easy to do."

Bill Connolly
Systems analyst
Steelcase, Inc.
Grand Rapids, Mich.

"A drop in international rates would affect our network plans, but at this point I can't say how. I do know that declining rates will probably make SDN much more of a real-world capability in Europe. Also, declining rates would probably make Europeans less reluctant to use the phone for business purposes. Currently, Europeans think twice before making long-distance calls because the rates are so high."

Bill Rush
Vice-president of
information systems
The Prudential Insurance
Co. of America
Roseland, N.J.

Wireless links keep Chicago exchanges honest, efficient

Trading system uses spread-spectrum technology.

By Barton Crockett
and Wayne Eckerson
Network World Staff

CHICAGO — Wireless local communications technologies promise to change the way some users do business.

Recently, the nation's two leading futures exchanges, the Chicago Board of Trade and the Chicago Mercantile Exchange, announced plans to codevelop a wireless communications system that will link traders on the floor with the exchanges' computer systems.

The Chicago Board of Trade

Traders will key in completed trades on hand-held devices, which will then transmit the information to host systems using either spread-spectrum radio or infrared technology.

Other users, including major stock exchanges, are also studying ways to apply wireless network technologies. According to Jeff Waldhuter, project development manager for wireless local networks at Nynex Corp., wireless communciations may someday find a home in virtually every organization.

"The number of applications you can use this technology for is only limited by imagination," Waldhuter said.

If the two Chicago-based futures exchanges are any indication, wireless communications may have a dramatic impact on the way organizations operate.

According to a Chicago Board of Trade spokesman, the auto-

(continued on page 41)

BOOK REVIEW

BY BARTON CROCKETT

Book urges net managers to act as entrepreneurs

Entrepreneurial Telecommunications, by Jim Jewett (Nashville: E.S. Press, c/o Telco Research Corp., 1989).

This decade has seen more than its share of popular and influential management books.

Unfortunately, few of these works are targeted at technical professionals such as network managers. In *Entrepreneurial Telecommunications,* Jim Jewett set out to rectify that situation. In the process, he produced a book that is both enjoyable to read and offers practical advice on how network managers can improve their performance.

Be an entrepreneur

Jewett, cofounder and chief executive officer of Telco Research Corp., a Nashville-based telemanagement software vendor owned by Nynex Corp., contends that successful network managers approach their jobs like entrepreneurs. They conceive new ways for networks to make their organizations more competitive and then work aggressively to implement their ideas.

In describing how network managers do this, Jewett outlines some of the most common management principles.

For instance, in describing how network managers foster innovation, Jewett recommends repeatedly experimenting with changes on a small scale, a process called "boot strapping."

Jewett describes in detail how network managers can integrate boot strapping into regular workday operations. In so doing, Jewett borrows heavily from management guru Tom Peters, who discussed the concept of boot strapping in his

(continued on page 20)

MANAGEMENT PROFILE

▲▲▲

BY WAYNE ECKERSON

Jeans maker Levi Strauss' headquarters in San Francisco.

Levi's net strategy pays big dividends

SAN FRANCISCO — After a leveraged buyout in 1985 put control of Levi Strauss & Co. in private hands, the company was able to funnel additional resources into carrying out a three-pronged technology strategy that is already paying handsome dividends.

The buyout took Wall Street's spotlight off the jeans maker, allowing it to focus on long-term strategic plans instead of boosting short-term profit margins to satisfy shareholders and analysts, according to company officials.

Levi Strauss is well known for LeviLink, a collection of services that help the company's retail partners automate every step of the retail cycle, including ordering, receiving and paying for Levi Strauss goods.

LeviLink incorporates such diverse technologies as electronic data interchange, bar-code scanning, point-of-sale data collection and electronic funds transfer.

Currently, 3,500 stores use one or more LeviLink services. Company officials conservatively estimate that LeviLink has accounted for a 5% increase in annual sales of Levi Strauss merchandise, which last year totaled $3.1 billion.

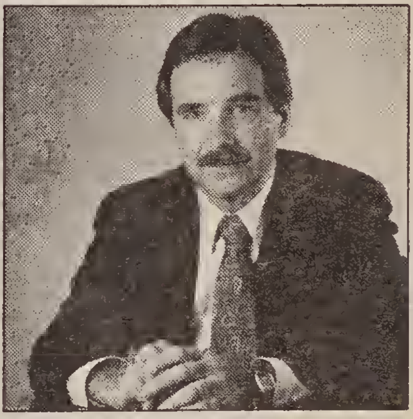
In addition to LeviLink, Levi Strauss' technology strategy calls for the creation of a centralized, on-line data base of sales and manufacturing information for its domestic network users. The company is also involved in an apparel industry effort to draft standards for the electronic exchange of three-dimensional graphics of clothing and fabric designs.

"The leveraged buyout really gave our company the breathing room to put considerable resources into developing technological applications that will improve customer service and enhance our internal operations," said Paul Benchener, director of Quick Response at Levi Strauss here.

Quick Response is the name of Levi Strauss' effort to automate business transactions with retailers and suppliers.

LeviLink

LeviLink was created in 1984 when the company formed management teams charged with investigating ways to improve customer service.


Levi Strauss' Paul Benchener

One team, which was led by Benchener, spent eight months interviewing customers to determine the kinds of information they wanted apparel manufacturers to include on clothing price tags and tickets.

The results of the study led Levi Strauss to include a Uniform Product Code (UPC) bar code on each ticket that would enable retailers to track sales and inventory based on the style, color

(continued on page 20)

Book urges managers to be entrepreneurs

continued from page 19

book, *Thriving on Chaos.* Jewett takes Peters' ideas and applies them to situations network managers encounter every day.

Jewett uses the same approach with other popular management concepts, such as "employee liberation," the process whereby a manager delegates decision-making power to qualified subordinates.

The value of this book lies in Jewett's ability to make important management ideas relevant to network managers. He offers simple but practical advice on how network managers can do their jobs better.

Just common sense

As is true with most management books, some people will find *Entrepreneurial Telecommunications* a simplistic treatise.

The book shies away from complex, technical subjects and focuses on management ideas some readers may consider commonsensible.

Even if a reader balks at the simplicity of Jewett's arguments, the author's lively prose and upbeat message makes this book an enjoyable, quick and easy read.

And most network managers could benefit from contemplating the book's main thesis — network managers should work to incorporate new management concepts into their fast-paced and complex jobs.

To obtain a free copy of the book, write to Telco Research at 1207 17th Ave. S., Nashville, Tenn. 37212, or call (615) 329-0031. ◘

Levi's net strategy pays big dividends

continued from page 19

and size of clothing. Preticketed items would save retailers anywhere from three to 14 days of processing and tagging time, which would get merchandise to store floors faster.

But that was only the beginning. Benchener said many retailers expressed an interest in using EDI to exchange purchase orders, advance shipping notices and invoices. After another year and a half of market research, Levi Strauss decided to offer these EDI services along with bar-coded merchandise tickets and bar-coded shipment cartons in a package it dubbed LeviLink.

Since then, LeviLink has expanded to include electronic funds transfer and a model stock management program, in which Levi Strauss generates suggested orders for retail stores by analyzing their past and present POS information. Also as part of LeviLink, Levi Strauss recommends personal computer-based software distributed by AT&T that allows small and mid-size companies to automate all parts of their business, from POS to accounts payable.

"LeviLink was an answer to the desire of our retail trading partners to squeeze the excess time out of the entire retail business cycle," Benchener said.

LABS

Levi Strauss is also in the midst of building a centralized data base containing information needed to manage customer orders, as well as manufacturing and shipping operations.

Called Levi's Advanced Business Systems, or LABS, the information repository will be built on IBM's DB2 relational data base management system running on CICS-based IBM 3090 processors located at a central data center here.

The system will replace a number of autonomous data bases used by different Levi Strauss units as well as a hodgepodge of data entry and batch processing programs running under a variety of IBM operating systems.

Thousands of Levi Strauss' employees in distribution centers, manufacturing plants and sales offices throughout the U.S. will be able to access the LABS data base via the company's existing domestic network. This network consists of a backbone of leased lines that connects IBM terminals in 11 sites to processors in the data center here.

In addition, the network supports dial-up connections between personal computers and the IBM processors.

The data base will enable employees to monitor customer orders, invoices and shipments, as well as to follow the manufacturing process from design to finished goods.

"LABS will be the key to our systems platform into the 1990s," Benchener said.

Graphics data interchange

The final element in Levi Strauss' technology strategy is a commitment to developing industry standards that will enable clothing designers and textile manufacturers to exchange three-dimensional graphical designs, a process known as graphical data interchange (GDI).

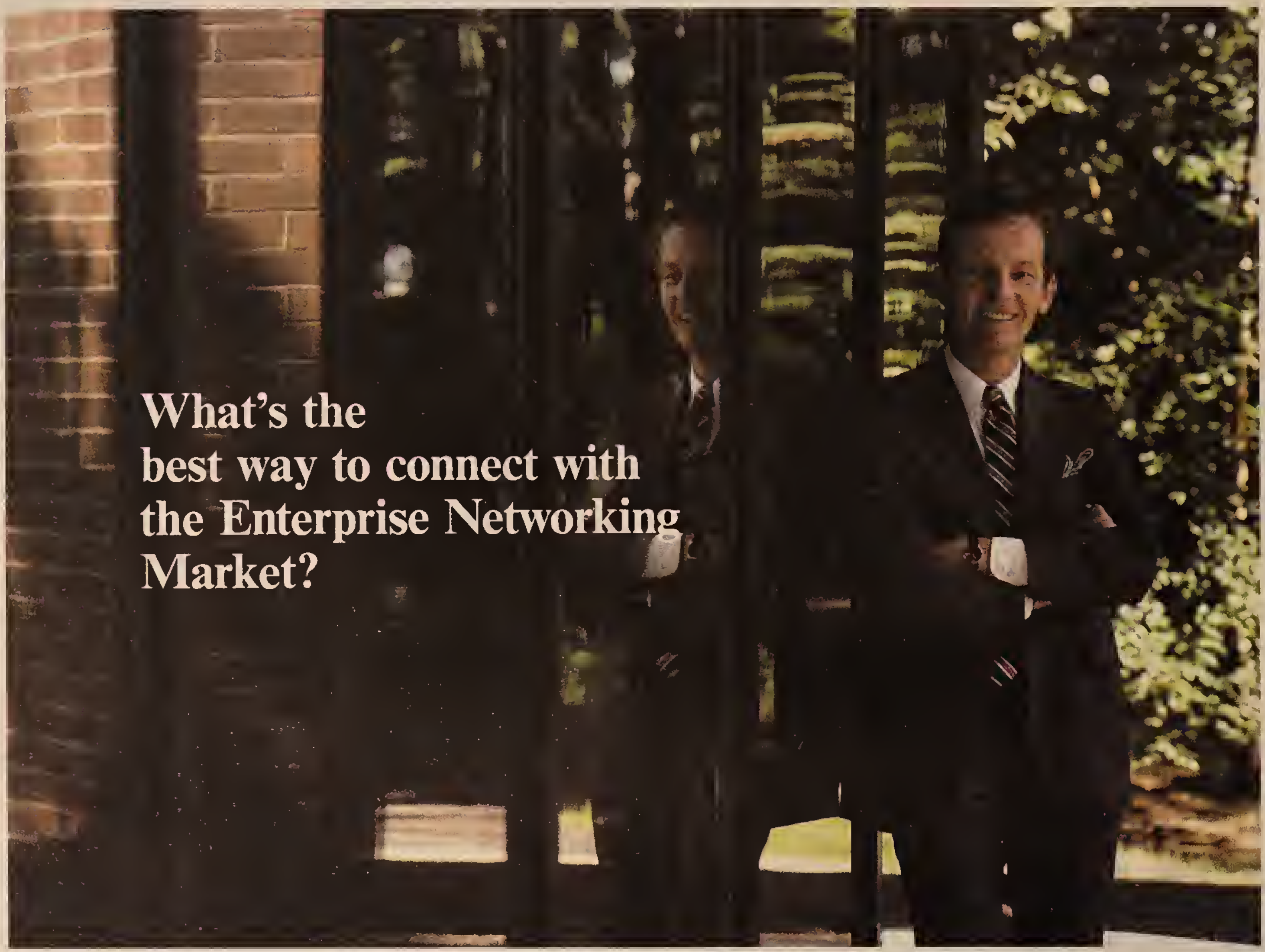
Currently, many vendors offer computer-aided design systems that provide three-dimensional representations of how clothing designs might appear when worn. Unfortunately, these systems are proprietary and can't read the CAD data generated by other systems. In addition, no industry standards exist for transmitting GDI data.

To foster the development of industry standards, Levi Strauss participates on the Textile Apparel Linkage Council (TALC) and the Sundries and Apparel Findings Linkage Council, two industry organizations responsible for establishing standards.

Jim Wilson, manager of LeviLink systems at Levi Strauss, recently formed a subcommittee within TALC for establishing voluntary industry standards for GDI.

"GDI standards will enable our clothing designers to work more closely with fabric suppliers — the end result being better designed, more appealing clothing," Wilson said. ◘

Gary Beach, Publisher, *Network World*



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Worth Noting

See inside for:

- The introduction of Micom's 56K/64K bit/sec voice and data multiplexer.
- A Fibermux multiplexer that lets IBM mini users support peripherals at three times the normal distance.

First Look

Kentrox introduces desktop TieLink 56

Kentrox Industries, Inc. recently released a new desktop version of its TieLink 56 data service unit/channel service unit for Switched 56 services. The stackable device is designed to be more compact than the company's existing rack-mounted version.

Customers can use the TieLink 56 for applications such as videoconferencing, Group IV facsimile, bulk data file transfer, computer-aided design and manufacturing, and local network bridging, Kentrox said.

The TieLink 56 is fully compatible with AT&T's Accunet Switched 56, US Sprint Communications Co.'s Virtual Private Network 56 and other switched digital services.

The list price for both the new desktop model and the existing rack-mounted model is $1,795. Prices for the products were dropped from $2,600 last month because a newer design has allowed the company to save money on parts, Kentrox said.

Kentrox Industries, Inc., a subsidiary of ADC Telecommunications, Inc., P.O. Box 10704, Portland, Ore. 97210; (800) 733-5511.

CLEO releases RJE software for HP 9000

CLEO Communications announced versions of its **3780Plus** remote job entry terminal-emulation software package for Hewlett-Packard Co.'s HP 9000 Series systems running HP-UX. The software combines CLEO's 2780 and

(continued on page 23)

Wang offers its TEMPEST fiber LAN

By Tom Smith
New Products Editor

LOWELL, Mass. — Wang Laboratories, Inc. recently unveiled a fiber-optic Ethernet local network that complies with the federal government's Transient Electromagnetic Pulse Emanations Standard (TEMPEST) security guidelines and prevents electronic eavesdropping.

TEMPEST products limit electronic emanation levels, making it difficult to use sensing equipment to tap data transmissions. Although these products are currently used almost exclusively by the government sector, Wang is targeting its offering at the financial sector as well.

The company also announced future security product plans.

Wang's new local network consists of the TEMPEST 802.3 Fiber Optic Hub and a choice of two IEEE 802.3 fiber-optic workstation interfaces. The interfaces are compatible with IBM Personal Computer ATs and Wang's PC280T, PC381T and PC382T microcomputers.

The PC 802.3 Non-Intelligent and Intelligent cards are equipped with a fiber-optic transceiver that converts Ethernet signals into light for transmission over fiber.

The PC 802.3 Non-Intelligent interface can be used in networks running Banyan Systems, Inc.'s VINES, Novell, Inc.'s NetWare and other standard network operating systems. The Intelligent interface allows personal computer users to run PC/VS Integration Services and access Wang VS peripherals, as well as store and share MS-DOS files on the local net server and print microcomputer files on VS printers.

The Fiber Optic Hubs can accommodate as many as three six-port Fiber Optic Media Interface Cards (FOMIC), or a total of 18 devices. The hubs can also be daisy-chained together by using one of the slots to support a Shared Resource Card (SRC), which is functionally equivalent to an Ethernet repeater. The network can support a maximum of 1,024 nodes.

(continued on page 22)

Fibronics takes wraps off System Finex FDDI wares

By Tom Smith
New Products Editor

HYANNIS, Mass. — Fibronics International, Inc. recently fleshed out its System Finex Fiber Distributed Data Interface (FDDI) product line with the introduction of a router that links FDDI networks to Ethernet and token-ring networks.

The company also announced a device to directly connect mainframes to 100M bit/sec FDDI nets as well as modules that boost the performance of its new router and its existing FX8210 FDDI-to-Ethernet bridge.

The new FX8310 router can be configured using newly introduced interface boards to link FDDI nets to Ethernet and the 4M and 16M bit/sec versions of token rings. Users can install two Ethernet boards, two token-ring boards or one of each in the router.

The FX8310 FDDI IP router, based on the Transmission Control Protocol/Internet Protocol, will enable FDDI-supported devices such as Sun Microsystems, Inc. workstations, to access Ethernet or token-ring networks, according to Hal Spurney, Fibronics' director of marketing.

The FX8310 costs $19,000 without network interfaces and is available now. The Ethernet interface, which is also available now, costs $5,000, while the token-ring cards, which will be available later this year, are priced at $7,000.

Both of the new interfaces are compatible with Fibronics' FX8210 FDDI-to-local network bridge, which the company has repriced.

The FX8210 preconfigured with one Ethernet connection now costs $18,000, down from $27,900. It will be available for $13,000 without interfaces. If a customer purchases the 8210 and two Ethernet interface cards, the cost is $23,000, or $11,500 per connection.

Fibronics also unveiled an FDDI interface that can be channel-attached to IBM or compatible mainframes. The FX8322 Mainframe Channel Attached Network Controller uses TCP/IP's Telnet remote logon utility to enable FDDI network users to access mainframes in the same manner as an IBM 3270 terminal, Spurney said.

The FX8322 supports data transfer rates of 24M or 45M bit/sec, depending on the IBM mainframe. It is priced at $35,000 and is available now.

Finally, the company rolled out a module for its bridge and

(continued on page 23)

Racal-Milgo net tool integrates mgmt.

Product controls Omnimux 8000 T-1 mux, CMS 2000, upcoming Omnimux 7000 channel bank.

By Jim Brown
Senior Editor

SUNRISE, Fla. — Racal-Milgo recently introduced a microcomputer network management program capable of controlling its Omnimux 8000 T-1 multiplexer, Communications Management Series (CMS) 2000 and the soon- to-be-announced Omnimux 7000 channel bank.

The CMS 8800 program runs on a DOS-based IBM Personal System/2 and eliminates the need to use separate terminals or Racal-Milgo's Multi-Link 4 software to access the management capabilities built into the respective devices.

The Multi-Link 4

The CMS 8800 software is based on Multi-Link 4, which enables a Personal System/2 to emulate the management consoles used with Racal-Milgo's Omnimux 8000; the CMS 2000, a system used to control Racal-Milgo modems and multiplexers; and the Omnimux Programmable Network Processor, an X.25 packet switch.

Multi-Link 4 made it possible to display windows representing the console screens of the various systems but required users to learn the individual commands for each system. The CMS 8800 lets users manage the Racal-Milgo products — except the packet switch — using one set of commands.

> The CMS 8800 lets users manage the Racal-Milgo products using one set of commands.
>
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The CMS 8800 collects alarms and status information from Omnimux 8000 T-1 multiplexers, CMS 2000-attached devices and the Omnimux 7000 channel bank — a product that will be announced at the Tele-Communications Association, Inc. conference later this month. After collecting the information, the CMS 8800 displays it in a single window that graphically depicts the network.

The program will maintain a historical data base containing records that detail network problems as well as a configuration data base.

The CMS 8800 cannot be used to monitor and control Racal-Milgo's Omnimux 9000 T-1 multiplexer, a product made by Digital Communications Associates, Inc. and resold by Racal-Milgo. The Omnimux 9000 must be managed by DCA's Network Management System software.

Racal-Milgo said the CMS 8800 may also be used to emulate the management console for the Omnimux Programmable Network Processor packet switch, although this feature has not been tested.

> Racal-Milgo intends to develop a version of CMS 8800 that runs under [IBM's] AIX.
>
> ▲▲▲

Simultaneous display

The company said users should be able to display the status of the Omnimux 8000 and CMS 2000 in one window while displaying the status of Omnimux packet switches in another window. However, users would still need to know the commands to control the switch.

By attaching the CMS 8800 to a separate microcomputer running Racal-Milgo's existing CMS View software, users can forward management data to IBM's host-based NetView.

Racal-Milgo intends to develop a version of CMS 8800 that runs under AIX, IBM's Unix implementation, said Richard Courtney, director of network management systems.

A CMS 8800 used to control an Omnimux 8000 net runs on a Personal System/2 Model 55-SX, while a CMS 8800 used to control both Omnimux 8000s and CMS 2000s requires either a Personal System/2 Model 70 or 80.

A three-year CMS 8800 software license costs $4,300. Users must supply their own Personal System/2.

Racal-Milgo can be reached in writing at P.O. Box 407044, Fort Lauderdale, Fla. 33340, or by calling (305) 475-1601. ◪

Wang offers TEMPEST LAN

continued from page 21

Available now, the hub is priced from $5,200 for six users to $9,800 for 18 users. The FOMIC and SRC hub boards cost $3,000 and $1,500, respectively. The Intelligent Card costs $1,500, while the Non-Intelligent Card is priced at $1,050.

Encryption tool

Wang also revealed that it is about to sign a Memorandum of Agreement with the federal government marking the completion of the evaluation of its Trusted Interface Unit (TIU-1).

TIU-1 is a stand-alone device that will provide Type 1 encryption of classified government data over local- and wide-area networks. Type 1 cryptography is defined by the National Security Agency's Commercial Communications Security Endorsement Program (CCEP), which sets encryption guidelines for data that is either stationary or in transit.

"Type 1 cryptography is the highest level of encryption there is," said Don Gangemi, Wang's director of secure systems. "It is approved for everything up through top-secret compartmented information.

TIU-1 supports Ethernet and Department of Defense Internet protocols. It will now begin the formal evaluation process that leads to CCEP endorsement. TIU-1 is expected to be available before CCEP endorsement in October. The fully endorsed product will be available in January.

Wang also announced plans for C2 security-level products endorsed under the federal government's Computer Security program. That program recommends security measures for data while it is being processed.

C2 systems adhere to the federal government's Trusted Products Evaluation Program guidelines on discretionary access controls, identification and authentication as well as object reuse and auditing.

A C2 operating system for VS minicomputers is available now in preendorsed versions. A fully endorsed version should be available by the end of the fiscal year. A fully endorsed C2 subsystem for Wang's 280 and 380 personal computer lines is expected to be available by December. It is available in a preendorsed version now.

Wang said it expects to ship a B1-level VS operating system in late 1991 or early 1992. B1 has all the security features required in C2 as well as several labeling requirements. ◼

Micom to unveil 56K/64K mux, 56K packet switch

By Tom Smith
New Products Editor

SIMI VALLEY, Calif. — Micom Communications Corp. is slated to use the Tele-Communications Association, Inc. show later this month to introduce a 56K/64K bit/sec voice and data multiplexer and a packet switch for 56K bit/sec lines.

Micom will demonstrate its VoiceMux 100 Time Division Multiplexer and MB300 packet switch at the show, which runs from Sept. 26 to 28 in San Diego.

VoiceMux 100 uses Micom's Advanced Packetized Voice (APV) module to compress voice transmissions to one-sixth their normal bandwidth.

Versions of the device can be configured to combine anywhere from two voice and five data channels to four voice and four data channels over a single 64K bit/sec link. No more than five channels can be used to transmit data because three channels are dedicated exclusively to voice.

APV uses two distinct voice compression algorithms to convert 64K bit/sec voice signals to data rates as low as 9.6K or 14K bit/sec, according to Leonard Frey, Micom product manager for voice products.

The company claims that despite the compression, the multiplexer will preserve the identity and emotional character of voices. To demonstrate the product, Micom will let users call in and hear compressed voice compared to standard voice, Frey said.

> VoiceMux 100 uses Micom's APV module to compress voice transmissions.
>
> ▲▲▲

The VoiceMux 100 will be available later this month. The version supporting two voice and five data channels is priced at $4,095, while the version supporting four voice and four data channels will cost $6,495.

The company will also unveil the MB300, a six-port X.25 packet switch, expandable to 12 ports, that costs less than $1,000 per port. The six-port version can be configured to support 19.2K bit/sec ports, or 56K or 64K bit/sec links. The six-port expansion card supports 19 2K bit/sec ports.

MB300 supports 320 packets per second.

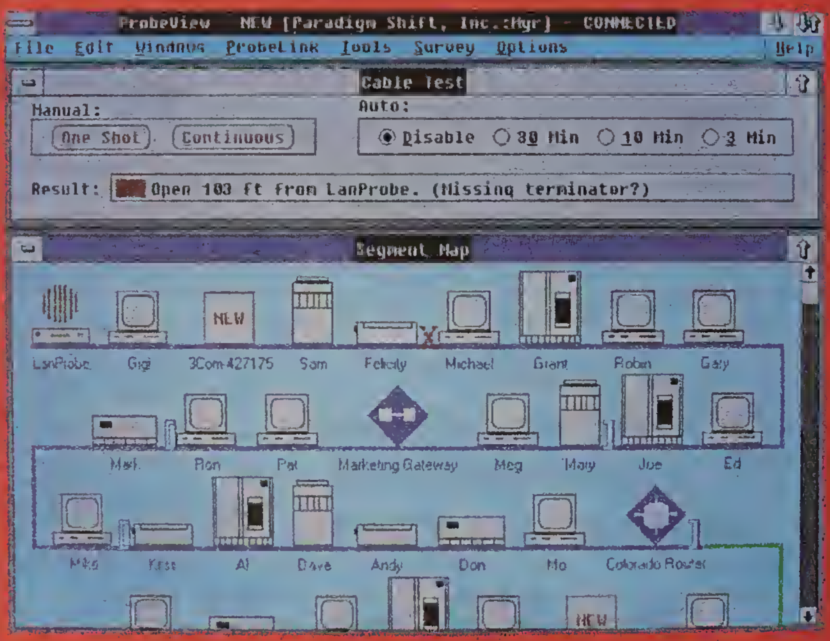
The switch can be controlled via Micom's Network Management System (XNMS), which runs under the Xenix operating system on any Intel Corp. 80386-based personal computer. Capable of controlling up to 300 nodes, XNMS provides users with configuration and billing information as well as statistics and real-time status updates.

MB300 features an alternate routing capability that reroutes traffic around failed switches.

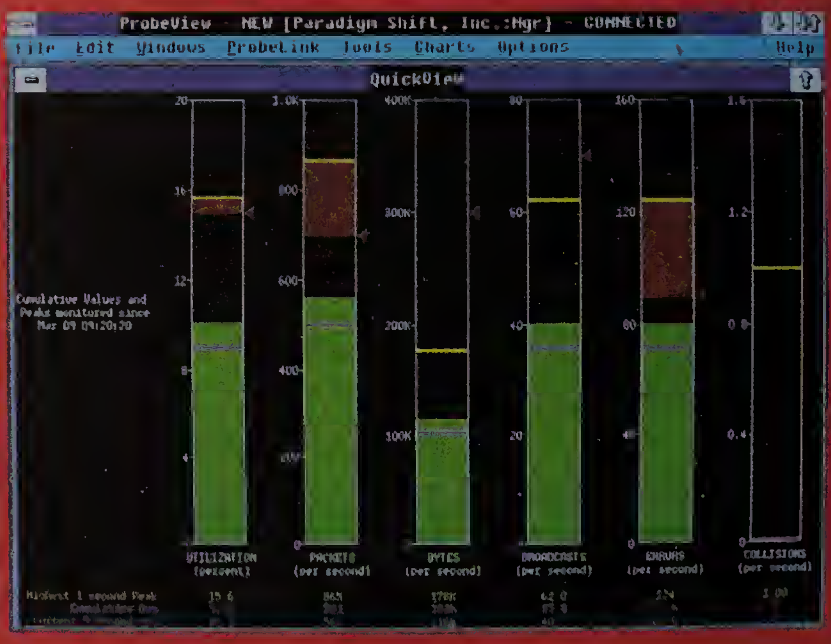
Configured with six low-speed channels, the MB300 is priced at $4,450; with six high-speed channels, $5,950; 12 low-speed channels, $5,700; and six high-speed and six low-speed channels, $7,200.

The MB300 will be available in September.

Micom can be reached in writing at 4100 Los Angeles Ave., Simi Valley, Calif. 93063, or by calling (805) 583-8600. ◼



Manual:
Auto: ● Disable ○ 30 Min ○ 10 Min ○ 3 Min
Result: Open 103 ft from LanProbe. (Missing terminator?)



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The LanProbe system lets you continuously monitor LAN traffic, track errors, set alert thresholds, and log critical network events. It maps the network for you. It tests for cable integrity

First Look

continued from page 21

3780 terminal-emulation software with SYNCcable, a device compatible with the HP 9000 Series' serial port.

The 3780Plus version supporting HP 9000 Models 825 and 835 is priced at $2,995. The version that supports HP 9000 Model 845 costs $4,995, and the version that supports HP 9000 Models 850 and 855 is priced at $6,995.

CLEO Communications, 3796 Plaza Drive, Ann Arbor, Mich. 48108; (313) 662-2002.

IPT software expands Apollo access

Information Presentation Technologies, Inc. (IPT), a subsidiary of Hewlett-Packard Co.'s Apollo Division, recently unveiled software that allows users of Apollo workstations to share files with Apple Computer, Inc. Macintoshes and MS-DOS-based personal computers.

IPT's new **Personal Server Network (PSN)** software, used with a new IPT uShare software module for Unix-based Apollo workstations, enables any Apollo device in a network to act as either a server or client node to Macintosh or DOS personal computers. Likewise, the PSN software package lets a Macintosh or personal computer act as either a server or a client to an Apollo workstation.

PSN is available now starting at $149 per node. Also available now, uShare is priced starting at $1,195 per node.

Information Presentation Technologies, Inc., 23801 Calabasas Road, Suite 2008, Calabasas, Calif. 91302; (818) 347-7791.

Fibronics takes wraps off wares

continued from page 21

router products that boosts performance by increasing the filtering rate from 11,000 to 22,000 packets per second.

The company also introduced an extender that enables its bridge and router to stretch the maximum possible distance between FDDI nodes to 20 km. Both modules are priced at $5,000 and are available now.

Fibronics can be reached by writing to Communications Way, Independence Park, Hyannis, Mass. 02601, or by calling (508) 778-0700.

Data Race adds modem to Action product line

Data Race, Inc. recently introduced a 14.4K bit/sec leased-line modem to its Action product line. **Action 1496** is a CCITT V.33-compatible synchronous modem with V.32 9.6K bit/sec automatic dial backup and restoral.

The modem includes automatic fallback and fall-forward features to maximize throughput on transmission lines of varying quality.

The modem also includes a full set of CCITT V.32 and V.22bis asynchronous modes with speeds ranging from 1,200 to 9.6K bit/sec.

The expanded Hayes Microcomputer Products, Inc. AT command set is included for use with personal computers.

Additionally, Action 1496 supports Microcom, Inc.'s Microcom Network Protocol (MNP) Level 4 for error correction and MNP Level 5 data compression, which allows data throughput of 19.2K bit/sec.

Available now, Action 1496 costs $1,795 for the stand-alone version and $1,745 for the rack-mounted model.

Data Race, Inc., 12758 Cimarron Path, Suite 108, San Antonio, Texas 78249; (512) 692-3909.

Fibermux mux stretches reach of IBM peripherals

FX7480 designed for AS/400, System/3X minis.

By Tom Smith
New Products Editor

CHATSWORTH, Calif. — Fibermux Corp. last week introduced a multiplexer that enables IBM minicomputer users to support peripherals at three times the normal distance.

Designed for use with IBM's Application System/400 and System/3X minicomputers, the FX7480 multiplexes up to eight twinaxial cables — each of which can support seven peripherals — over a single cable.

IBM AS/400s and System/3Xs can normally accommodate twinaxial cable runs at distances up to 1,500 meters, according to Emily Green, Fibermux vice-president of marketing.

The FX7480 time-division multiplexer can be used with a variety of media. Use of fiber-optic cable adds 3,000 meters of reach between multiplexers; coaxial or twinaxial cable adds up to 1,000 meters; and twisted-pair wire can be used to add 300 meters between multiplexers.

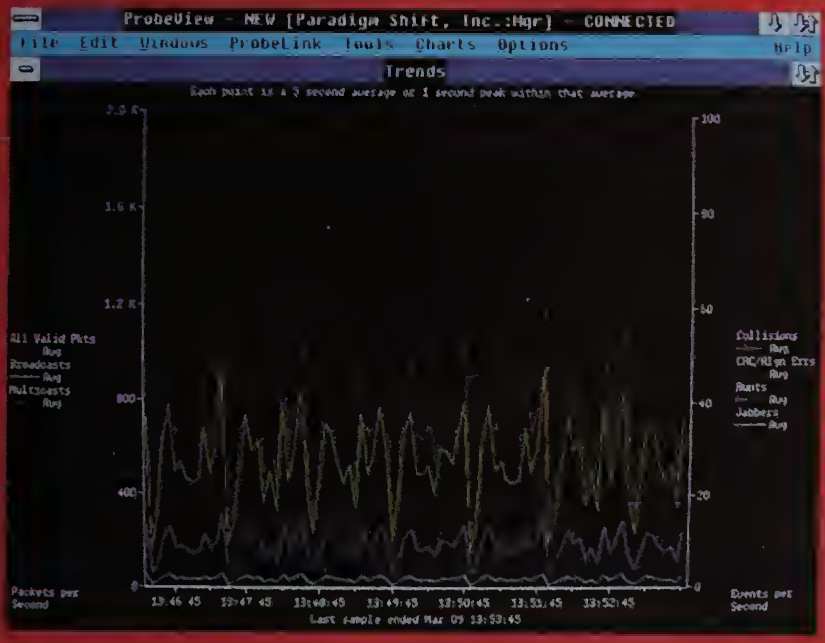
Twinaxial cables hung off the remote multiplexer can still range in length up to 1,500 meters.

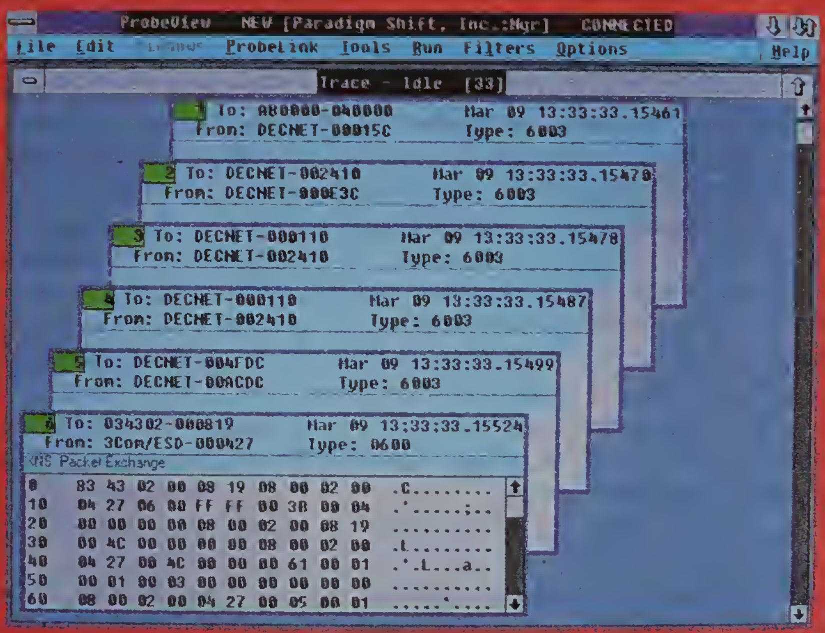
Communications between the multiplexers occurs at the IBM minicomputer data transfer rate of 1M bit/sec, Green said. The speed at which responding devices, such as printers and terminals, can accept data varies by as much as 3%, but the FX7480s can accommodate the slightly different clock rates.

The multiplexer has diagnostic and monitoring functions that help track performance. Manually initiated loop-back tests enable users to determine whether the remote multiplexers and terminals are performing properly. A front-panel display offers 12 LEDs to help track events such as polling by the minicomputer, loop-back testing in progress and transmission of data.

The FX7480 is priced at $2,950 and is available now.

Fibermux can be reached by writing to 9428 Eton Ave., Chatsworth, Calif. 91311, or by calling (818) 709-6000.




ProbeView NEW [Paradigm Shift, Inc.:Mgr] CONNECTED
File Edit Windows ProbeLink Tools Run Filters Options Help
Trace - Idle [33]

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  From: DECNET-00015C        Type: 6003
2 To: DECNET-002410          Mar 09 13:33:33.15470
  From: DECNET-000E3C        Type: 6003
3 To: DECNET-000110          Mar 09 13:33:33.15478
  From: DECNET-002410        Type: 6003
4 To: DECNET-000110          Mar 09 13:33:33.15487
  From: DECNET-002410        Type: 6003
5 To: DECNET-004FDC          Mar 09 13:33:33.15499
  From: DECNET-00ACDC        Type: 6003
6 To: 034302-000819          Mar 09 13:33:33.15524
  From: 3Com/ESD-000427      Type: 0600
XNS Packet Exchange
0     83 43 02 00 08 19 08 00 02 00   .C........
10    04 27 06 00 FF FF 00 3B 00 04   .'......;..
20    00 00 00 00 08 00 02 00 08 19   ..........
30    00 4C 00 00 00 00 08 00 02 00   .L........
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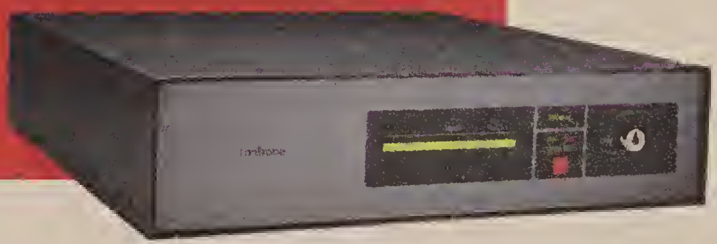

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OPINIONS

VIDEOTEX

BY WALTER ULRICH

AT&T's entry may spark evolution, not revolution

On Aug. 24, AT&T was permitted to both own and operate data base and other information-intensive services. Some analysts have predicted that AT&T will be the catalyst to help the videotex market explode. While AT&T's entry will certainly be beneficial, can we expect it to be pivotal?

What unique attributes, which have eluded past and current vendors such as Knight-Ridder, Inc., The Times Mirror Co., The Dun & Bradstreet Corp., Dow Jones & Co., Inc., CompuServe, Inc., Prodigy Systems, Inc. (and numerous smaller companies such as Boston Citinet and U.S. Videotel), does AT&T bring to the consumer videotex market? Special communications facilities? Neither U.S. District Court Judge Harold Greene nor I think so. Previous videotex market experience? No, that was prohibited. Revolutionary new hardware? No, that's not AT&T's strength. How about revolutionary software? Perhaps new software, but it is unlikely to be revolutionary.

AT&T's past successes in data communications and enhanced services have been evolutionary, not revolutionary. AT&T's revolutionary network, Net1000, was a costly failure. And we are still waiting for the Picturephone to find its way into our homes. Large companies generally do not foster revolutionary advances; AT&T is no exception.

AT&T has succeeded in introducing evolutionary products that encourage continued market growth and generate profits for AT&T. The company's entry into the electronic mail marketplace is a case in point.

AT&T was the last major service company to enter the E-mail market in 1984, well behind McDonnell Douglas Network Systems Co., Telenet Communications Corp., Dialcom, GE Information Services, MCI Communications Corp. and others. AT&T waited for the market to develop from infancy to early adolescence before joining in. It learned from both users and existing competitors; then it designed a first-rate service, building on the previous experiences of others.

AT&T's initial marketing of AT&T Mail was low-key. While other companies such as MCI and Western Union Corp. invested large sums in marketing, AT&T's marketing activities grew gradually, as the market grew. The company has now built a respectable volume of traffic and is also offering electronic data interchange and other related services.

AT&T's entrance into the consumer videotex market may be similar. After nearly a decade of videotex trials, the industry is now beginning to take off. Several current players are expected to introduce major advertising blitzes this fall to stimulate market interest. The industry is building momentum.

The videotex industry is teetering on the brink of success, but AT&T's entry will not provide the impetus to push it over the top. With or without AT&T, it will continue to develop and grow.

AT&T's entry into electronic publishing and videotex adds the financial weight and technical strengths of an important and powerful business leader. It unleashes at least some part of AT&T's sales force and distribution channels, and it adds legitimacy for small businesses and many customers.

AT&T has become a smarter and more sophisticated company in the last five years. Its entry is less likely to start a revolution than it is to signify confidence in the continued evolution, growth and importance of the videotex market. Business videotex matches nicely with its existing products; consumer videotex is a natural extension. AT&T is advantageously positioning itself to remain a communications giant well into the next decade and, perhaps, the turn of the century.

Ulrich is a leader in Arthur D. Little, Inc.'s information and telecommunications systems consulting group in Cambridge, Mass. He speaks and writes frequently on information and communications industry issues.

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EDITORIAL

Users and vendors must team up to solve ISDN problems

One of the hindrances stymieing the acceptance of Integrated Services Digital Networks is the lack of functional and affordable customer premises equipment. Although the customer premises equipment problem is by no means the only obstacle facing ISDN — the very availability of service is limited — it does represent a critical sticky wicket.

We need users and vendors to form alliances to define needs, explore development options and, ultimately, establish product test centers.

Failing that kind of cooperation, users will be forced to try to seek options on their own. West Virginia University in Morgantown, for example, foresaw the limitations of ISDN customer premises equipment and set up its own test lab.

"Frankly, I don't know how we would have implemented ISDN without the lab," wrote Jeffrey Fritz in a recent article contributed to *Network World* ("ISDN trendsetter discusses use of technology at WVU," Aug. 15). Fritz is a data communications analyst at the university.

In January, the National Institute of Standards and Technology proposed building public ISDN "technology transfer centers," but the plan was grounded because of a lack of funds. Some members of the North American ISDN Users' Forum have since tried to take up the crusade, a gallant effort that should be supported by users and vendors alike, if not mimicked.

Besides helping to identify ISDN applications, cooperation in such centers could speed the development of useful products. One early ISDN user, for example, says he needs a product that will enable him to get around running Basic Rate Interface lines to every station in his Centrex environment.

He hoped to find a key telephone system that could terminate multiple Basic Rate Interface lines from the Centrex serving office and was flexible enough to accommodate a range of end-user configurations. Such a product would let him extend the full capacity of 2B+D links to users that needed it and divvy up the capacity of other Basic Rate Interface lines to support single stations. His product search left him unsatisfied.

> West Virginia University foresaw the limitations of ISDN customer premises equipment and set up its own test lab.
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It also left him with a better understanding of the nascent ISDN customer premises equipment market. His conclusion: Buyer beware. When you can find the ISDN products you need, don't bet your lunch that they will do everything the maker claims. Some products said to support 2B+D actually support only 1B+D.

Many of the early ISDN products are also quirky, prone to strange failures. One problem we recently heard about required dragging equipment back to the factory to have it reprogrammed. Other horror stories abound, which gives all the more credence to those calling for the establishment of testing centers.

But one thing test centers will not be able to address is equipment costs. "Our greatest disappointment with ISDN has been the high cost of ISDN customer premises equipment, especially in comparison with equivalent analog gear," Fritz wrote in his article.

As Fritz admits, ISDN equipment supports higher speeds and new functions, so a direct comparison is difficult to make. But given the fact that vendors are counting on users to develop ISDN applications that will fuel future market growth, vendors should be willing to amortize their development costs over a longer period to lower users' entry costs.

It comes down to simple cooperation. Solving the ISDN customer premises equipment equation will require users and vendors to team up. The sooner, the better.

DISTRIBUTED COMPUTING

BY MARY JOHNSTON

New models for operations support are necessary

Improvements in the price and performance of personal computers and low-end workstations are pushing the use of desktop computers well into the ranks of the technically illiterate. The improved user interfaces of the Macintosh and OS/2 encourage businesspeople, students and others who have no idea what an operating system is to invest in computers and software.

In corporations, individual departments are choosing hardware based on the applicability of software packages and the tenacity of vendor salespeople. Consideration for technical issues such as networking, connectivity and compatibility with other corporate resources are left by the wayside.

In response to this trend, some organizations have begun endorsing corporate standards for hardware and software. Unfortunately, few companies have geared up to provide hands-on support or even value-added supervision of user and departmental activities.

Pleading lack of resources, the classic MIS and telecommunications shops have ceded responsibility for personal computers, workstations and local networks to the user departments.

However, as personal computers, workstations and networks become commodity-type resources, relied upon by nontechnical users, departmental technical support erodes quickly. Without corporate leadership, departments generally deal with the support gap in one of two ways:

- Ignore it until the entire system crashes and the resulting chaos requires a better solution, or
- Allow ad hoc support to spring up, often resulting in some of the best and most senior — and most highly paid — employees wasting large amounts of time providing technical support.

At this time, there is no clear-cut solution to the problem. One reason is that comprehensive local network management tools are difficult to come by.

Secondly, most corporations resist creating large central management and support organizations, hoping to limit corporate support to truly common concerns — such as T-1 backbones and mainframe payroll systems — and push department-specific control and creativity out to the units.

Unfortunately, the proliferation of desktop computing and local networks has made these technologies corporate resources rather than departmental concerns. Corporate electronic mail, file transfers and applications accessing multiple data bases require some level of connectivity and compatibility among corporate systems.

Some organizations have begun endorsing corporate standards for hardware and software.

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Organizationwide configuration management, repair supervision, user training, software updates and product acquisition are nearly impossible without central guidance.

Instead of investing in site licenses and a few dedicated support resources, companies wastefully spend dollars on duplicate software, outside training courses and hourly repair and installation charges from third parties.

The fundamental change in the nature of desktop computing challenges companies to reevaluate existing budget and management policies and politics. Organizations that address this challenge may find that they must reassign reporting responsibilities for MIS and telecommunications, redraw the boundaries between computers and communications, revise chargeback systems and invest in additional in-house staff and supervision.

Accomplishing this requires businesses to take a creative approach. Budget managers may balk at the staff increases this reassessment may require. To justify those costs, companies must quantify the lost productivity of senior staff who spend many hours per week providing ad hoc support, the fees currently spent on outside agencies to perform those functions and productivity improvements that would result from connectivity.

Benefits of site licenses and better tracking of repair and purchasing also favor in-house staff investment.

However, the real test of an organization's commitment to support desktop computing and local nets comes when departments are asked to share control of those resources. Autonomous departments are loath to transfer any responsibility back to the central organization.

Instead of billing department-specific support resources or central staff to the divisions, the real solution is an indepartment support staff that is part of the central MIS/telecommunications staff budget. The person filling this unique role must not only report to both the end-user department and MIS, but also is subject to selection and evaluation by both. Small departments that do not require full-time support could share a single resource.

The benefit of this arrangement is that the departments get reliable, timely access to support resources while corporate standards are actively implemented. By being aware of corporate goals and trends, departmental support staff can better target future departmental investments and migration strategies.

In a utopian society, such an organizational transformation could be implemented overnight. For the real corporate community, however, such changes in communications and computer responsibilities must be carefully staged and accompanied by broad-based user buy-in. To use desktop computing effectively, an organization must evaluate its ability to support and interconnect these investments and make fundamental changes to provide adequate support.

To ignore the changing requirements brought on by personal computers, workstations, local networks and internetworking of local nets is a strategic oversight that will require much more costly solutions later on. ◘

Johnston is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting collaborative specializing in management, communications and information strategies.

TELETOONS

BY FRANK AND TROISE

Ah, yes... the new troubleshooter.
Phil Frank

LETTERS

The vendor voice

The article "Users connecting LANs face complex choices" (*NW*, Aug. 7) not only omitted our IB/3 and gateway server products from the competitive charts on pages 36 and 38, but also misrepresented 3Com Corp. and our 3+ network operating system product family.

Our records show that 3Com's public relations department submitted chart-related data on the IB/3 at the same time as the IB/2000 data you included; we never received a request for data about our gateway servers, which have been part of 3Com's networking product line since 1987.

In addition, the callout on page 35 states: "Don't assume that compatibility with 3Com's 3+ means the gateway will work with the current version of that system installed at your location."

Current releases of 3+ include Network Basic I/O Sys-

(continued on page 41)

Network World *welcomes letters from its readers. Letters should be typed, double-spaced and to Editor,* Network World, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701. Letters may be edited for space and clarity.*

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FEATURES

Apocalypse now?

In the wake of recent fires, fiber cuts and failures, experts are reevaluating the vulnerability of the public switched network.

Part 1 of a two-part article examining the vulnerability of the public switched network.

Is the public switched network truly safe from harm? Are the long-distance carriers, regional Bell holding companies, fiber consortiums and federal government doing all they can to ensure the survivability of the network against natural and man-made disasters?

The verdict is mixed. In the aftermath of the Illinois Bell Telephone Co. central office fire in Hinsdale, Ill., AT&T's New Jersey fiber cut last year, the Brooklyn central office fire of 1987, the Mexico City earthquake of 1985, and most recently, the AT&T central office switch failure in Atlanta, experts are now hotly debating the well-being of a network that appears to be especially vulnerable to fire, electrical outage, focused overloads and even terrorist attack.

As though depicting a tale of two entirely different networks — one shining and defensible, the other fragile and insufficiently redundant — critics and proponents offer entirely different visions of the network's strengths and weaknesses. Engineers from AT&T, for example, cite advances in signaling technologies, operational support software and dynamic routing schemes that, they claim, make their long-distance international network more robust, resilient and self-healing than ever before.

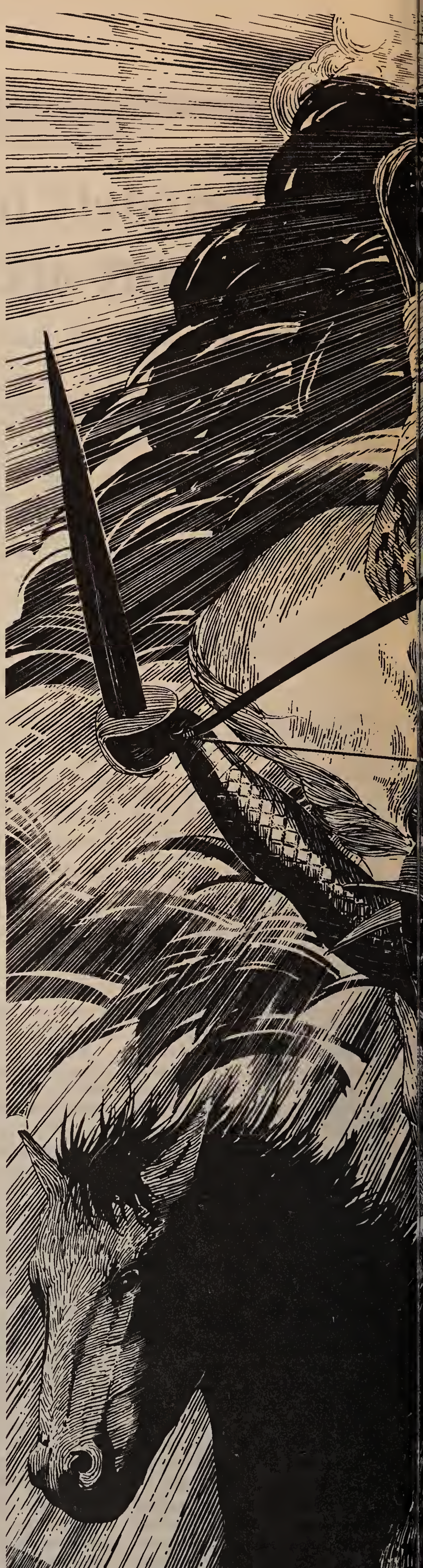
Critics, however, say that diverging network standards, as well as new technologies such as digital switching, fiber, software-defined networks, network data bases and common channel signaling, have forced an unprecedented concentration of network traffic and resources into fewer critical switching nodes, channels and signal transfer points (STP).

"Networks are becoming more vulnerable to disruption, whether caused by natural disasters, industrial accidents, or deliberate acts of sabotage or war," asserts

(continued on page 30)

Emmett is a free-lance writer based in Hewitt, N.J.

By ARIELLE EMMETT



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(continued from page 26)

John McDonald, a senior vice-president of Contel Corp. in New York and chairman of the National Academy of Sciences/National Academy of Engineering Committee on the Review of Switching, Synchronization and Network Control in National Security Telecommunications.

Increased vulnerability

"A few well-placed hand grenades would crash major portions of the domestic long-distance networks," McDonald said when he testified during a Senate Committee on Governmental Affairs hearing last February on the vulnerabilities of the network to terrorist attack. The reason, he claimed, is that "Our long-distance networks rely upon network control provided by a very limited number of signal transfer points."

Specifically, STPs are part of Common Channel Signaling (CCS), a technology the long-distance carriers — and, to a lesser extent, the RBHCs — now use to manage signaling on the public switched network. CCS is currently concentrated in "a very limited number of critical packet-switching nodes" that are physically separate from the voice and data communications channels available, McDonald says. "The concentration of the signaling software and hardware into a subnetwork means greater vulnerability than if the signaling function were spread throughout entire networks," he explains.

> "During the Mother's Day weekend of 1988 — the time of the Hinsdale fire — we had tremendous traffic surges. We could not complete that traffic because the group [in Chicago] was isolated. If one hub goes out at a major switch, you have major isolation."
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Since the Hinsdale central office fire in May 1988, which wiped out telephone service to 500,000 Chicago-area customers for periods of up to two weeks, some experts have pointed out that network vulnerabilities are increasing. Besides the alleged fragility of the national signaling network, fiber routing and digital "megaswitches" in both long-distance and metropolitan networks now concentrate literally millions more calls into fewer facilities than in the predivested network of the Bell system, critics say.

Moreover, the majority of RBHCs and local companies continue to use fixed routing and single hub or gateway architectures at the local loop without built-in redundancy — leaving open possibilities for network failures as extensive as Hinsdale's.

"The BOCs still have a lot of traffic concentrated at critical points with minimal redundancy and diversity," observes David Link, a vice-president of network engineering at MCI Communications Corp. "During the Mother's Day weekend of 1988 — the time of the Hinsdale fire — we had tremendous traffic surges," Link says. "We could not complete that traffic because the local group [in Chicago] was isolated. If one hub goes out at a major switch, you have major isolation."

The vulnerability of hub architectures may be compounded by the use of high-capacity fiber, according to network managers at Bell Communications Research, Inc. in Livingston, N.J. "If you go back a few years to copper technology — the low-capacity stuff — you could build a minimum, low-cost network, and if you cut a line, you could still make calls," says Richard Cardwell, district manager of network management technology at BELLCORE. "Now though, with fiber-optic technology and the ability to put thousands of circuits on a couple of glass strands, if you build a minimum cost network [without redundancy] and it breaks, your network could be disconnected."

Serious risks

But how serious is the threat of disconnection and major disruption to the public switched network? Again, the assessments vary based on historical experience and relative viewpoint of the network provider or consultant. "We still have a tremendous amount of risk out there," MCI's Link says. "[A lot] of effort has to be made in local exchange planning to make sure that we don't have enormous amounts of traffic concentrated in any one area."

"The threat is pretty serious," agrees John Powers, a principal of Powers Tritsch & Associates, Inc., a Wellesley Hills, Mass.-based consulting firm specializing in contingency planning and user auditing for disaster recovery. "The RBHCs and long-distance carriers haven't done enough [in the way of contingency planning or disaster recovery]. Hinsdale simply woke up a lot of providers to vulnerability issues. To say we've already taken remedial action isn't true yet.

"Thousands of voice channels that historically were traveling over hundreds of thousands of regular copper wire pairs are now multiplexed down to a few strands of fiber — a width no greater than a garden hose," Powers says.

Fiber cuts are relatively commonplace these days, according to Powers and other observers. "The general rule of thumb is that you will experience one fiber cut per year per thousand miles of fiber," says Roy Wilkens, president of Williams Telecommunications Group, Inc. (WTG) in Tulsa, Okla., a nationwide fiber-optic carrier.

Fiber cuts are commonplace because most cable is typically buried along railroad rights-of-way and other exposed areas that are easily dug up by the contractor's backhoe, Wilkens says. He says his company takes special measures to protect its cable by burying it inside or alongside steel pipe.

"It's difficult [and extremely costly] to put in completely separate fiber systems to accomplish diverse routing," Wilkens adds. "The customer has to pay for two circuits. As far as I know, no one has fully diverse routes."

Lack of diverse routing can create serious network disruptions during a cut. Last November, for example, when an AT&T fiber backbone cable was accidentally cut in New Jersey, long-distance service to the Northeast was disrupted throughout the day, and AT&T's domestic network was completely isolated from Europe for 13 hours.

Fiber bombs?

Besides day-to-day vulnerabilities, the threat of terrorist attack on critical switches and common channel signaling centers remains real, according to industry analysts.

"If I were a terrorist and wanted to shut down the nation's network, it would be incredibly easy," claims Daniel Briere, president of TeleChoice, Inc., an industry consulting firm in Alexandria, Va. "I wouldn't target the network's signal transfer points — why take a chance bombing [equipment located inside] an office complex? Instead, I'd put five or six well-placed bombs on the fiber backbone. Since the carriers lease one another's lines, I could take out a substantial portion of the network overnight."

However, not everyone agrees. WTG's Wilkens, for example, says, "The network is safe. Each carrier has the ability to transmit almost all the telephone calls in the U.S. over a single backbone, and there are four or five major fiber backbones in the U.S. Some carriers have arrangements to switch over calls to one another [in the event of outages or other emergencies]; and each of us has a fiber protection system — a backup fiber pair used in emergencies."

> "If I were a terrorist and wanted to shut down the nation's network, it would be incredibly easy," TeleChoice's Briere claims.
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Governmental organizations concur in principle. For example, the Federal Communications Commission and the National Communications System (NCS) both assert that the public switched network is capable of handling virtually any emergency short of outright nuclear war. The NCS is a coordinating federal group that oversees national security telecommunications preparedness and works to ensure the interoperability of telecommunications networks.

According to one of its national security advisers, "[The FCC] is not pursuing any active investigations of vulnerabilities. We feel that things are well in hand; mechanisms are in place so that in the event there is an emergency, we can bring about a quick restoration of service." The FCC official cites such emergency preparedness groups as the Joint Telecommunications Resources Board, a White House advisory group established by the Reagan administration to make recommendations and develop resources to restore network service to the public and government agencies in the event of major disaster.

> "A few well-placed hand grenades would crash major portions of the domestic long-distance networks," Contel's McDonald said.
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Benham Morriss, deputy manager of the NCS, which supports the telecommunications preparedness activities of 23 federal member organizations, confirms this. "Major disruptions of the nationwide telecommunications networks during peacetime emergency or disaster would be highly unlikely," he testified last February before Sen. John Glenn's (D-Ohio) Government Affairs Committee hearings on terrorism.

Citing various federal groups commissioned to cope with both local and national emergencies, Morriss added: "The individual networks have diverse, robust and redundant transmission facilities and switching capabilities, which enable them to reroute traffic or restore facilities with very limited loss of telecommunications capability." Absent a major regional disaster, such as an earthquake or hurricane, Morriss said, regional telecommunications share the same facilities and are similarly protected from major disruption from isolated incidents."

During the hearings, Morriss suggested that the Hinsdale fire was an isolated, regional incident affecting only 35,000 customers. "Except for calls destined for the Hinsdale service area, the rest of the nationwide network was unaffected," he said. "Long-distance calls were routed around the Hinsdale facility." However, Morriss didn't mention that all long-distance traffic out of Hinsdale, both as a hub for several local central offices and as a point of presence (POP) for the long-distance carriers, was disrupted for periods of up to two months.

In addition, Morriss didn't directly address the level of perceived terrorist threat to the network or the government at large. He said, however, "The telecommunications industry is aware of the potential threat posed by terrorism. Corporate security forces and management are continually seeking ways to improve physical and information security measures."

Morriss adds that various government groups — among them the National Coordinating Center (NCC), which was established in 1984 as part of the NCS to assist in the coordination and restoration of service to localities and regions affected by disaster — are stepping up planning and participation in various federal exercises dealing with terrorism.

A federal perspective

Some government observers, however, are not satisfied with current federal initiatives. Citing a maze of federal groups estab-

(continued on page 41)

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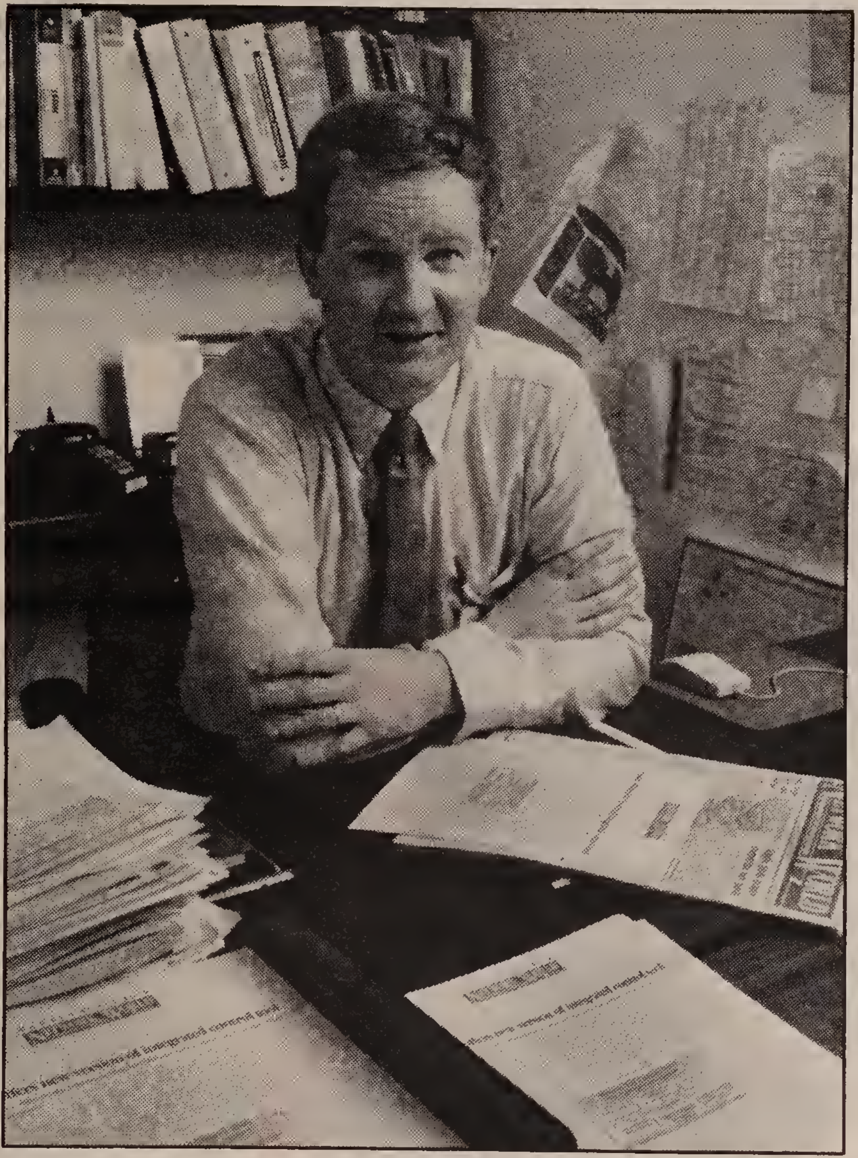

Based in Canton, MA, Codex Corporation is a subsidiary of Motorola with 4,000 employees in 50 countries. It's the largest independent supplier of integrated networking equipment and systems. And, according to Chris Carroll, Media Relations Manager, keeping the marketplace up-to-date on the company's broad range of voice and data communications systems is no easy task. Fortunately, Codex gets lots of help from *Network World* editorial.

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NETWORK WORLD
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Higher and higher

Network World's fourth annual survey reveals the budget expectations of communications managers.

CONTINUED FROM PAGE 1

TFS COMM/SURV has been conducting communications spending surveys and constructing industry spending models for five years.

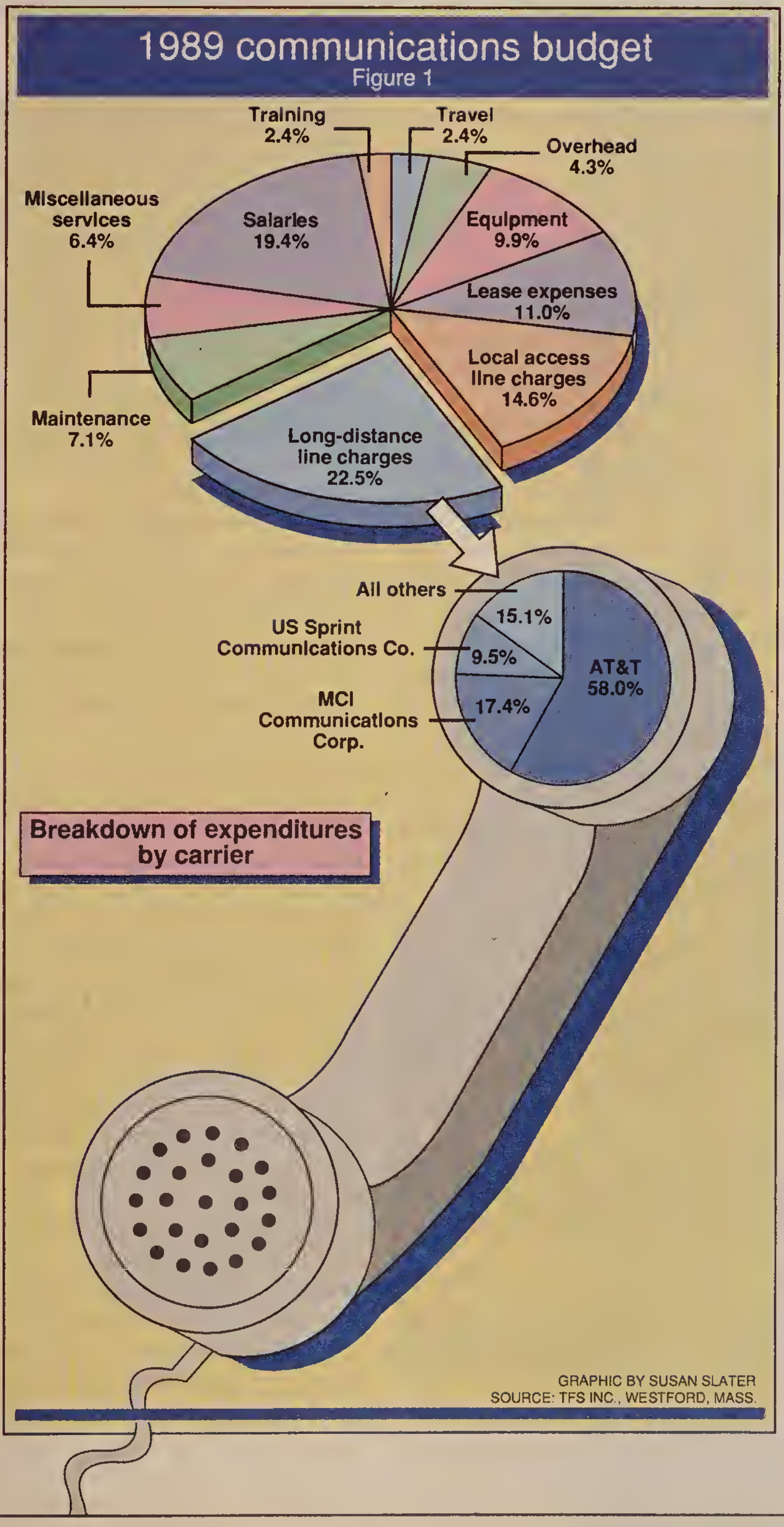
The survey was conducted this year in a novel fashion: Instead of mailing questionnaires, the firm mailed a survey programmed on computer disks and asked respondents to boot the program and complete the questions on their own personal computers (see "Survey methodology," page 40).

The survey shows that the average communications operating budget is up 7% over last year and predicts that operations spending will be 9% higher in 1990 than in 1989.

It also shows that the percentage of the operating budget spent on data communications is rising. In 1988, the companies spent 40.8% on data communications, compared to 56.6% for voice and 2.6% for video. In 1989, they will spend 41.6% on data, 55.5% on voice and 2.9% on video, and

(continued on page 36)

Gilbert is a principal with TFS, Inc. and director of the firm's COMM/SURV program, a syndicated research service that monitors the communications industry via survey-based research on leading end-user organizations. TFS, based in Westford, Mass., is a consulting and research firm specializing in the information systems and communications industries.



1989 communications budget
Figure 1

GRAPHIC BY SUSAN SLATER
SOURCE: TFS INC., WESTFORD, MASS.

(continued from page 35)

they expect the 1990 proportions to be 42.4% for data, 54.2% for voice and 3.4% for video.

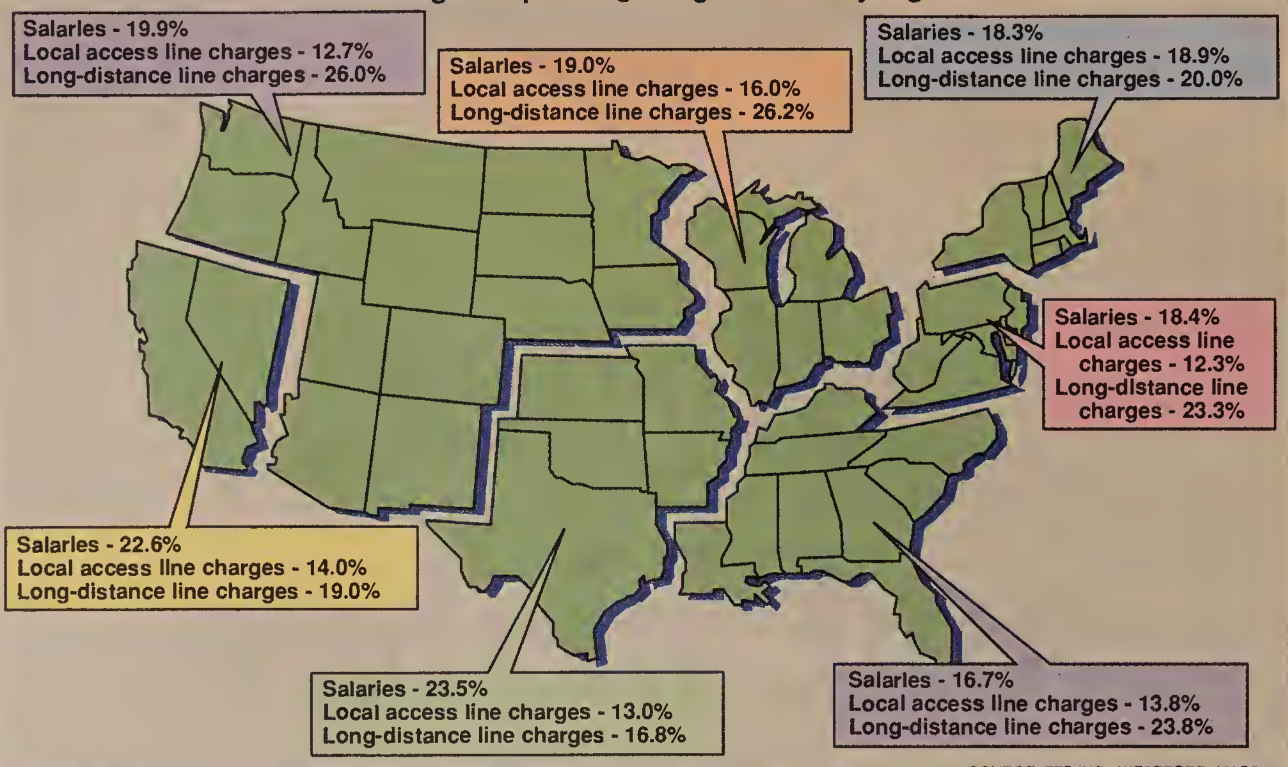
Figure 1 on page 35 shows in detail where the budget money is going in 1989: 37% of the communications budget is spent on line charges, with long-distance charges about 50% more than local charges. One out of every five budget dollars, or 20%, goes to salaries. Equipment and leases account for 21% of the total expenses.

The spending data also tells us something about life after divestiture. AT&T's portion of the long-distance budget is now less than 60%. In particular, MCI Communications Corp.'s efforts to penetrate the business market have paid off in market share, and in cash, if you follow the financials of the carriers.

Spending on salaries and line charges

Figure 2

Percentage of operating budget shown by region


Salaries - 19.9%
Local access line charges - 12.7%
Long-distance line charges - 26.0%
Salaries - 19.0%
Local access line charges - 16.0%
Long-distance line charges - 26.2%
Salaries - 18.3%
Local access line charges - 18.9%
Long-distance line charges - 20.0%
Salaries - 18.4%
Local access line charges - 12.3%
Long-distance line charges - 23.3%
Salaries - 22.6%
Local access line charges - 14.0%
Long-distance line charges - 19.0%
Salaries - 23.5%
Local access line charges - 13.0%
Long-distance line charges - 16.8%
Salaries - 16.7%
Local access line charges - 13.8%
Long-distance line charges - 23.8%

GRAPHIC BY SUSAN SLATER

SOURCE: TFS INC., WESTFORD, MASS.

Who spends what?

The spending habits of companies vary by size, region, industry and individual predilection. The size information breaks down into two main categories: companies with separate communications capital budgets and companies that include capital spending within the operating budget.

Of the organizations examined, some 55% have separate capital budgets for the acquisition of major communications gear; they tend to be the larger organizations. Separate capital budgets help management decide how to acquire equipment — whether to purchase, lease or rent — and how to capitalize and amortize the equipment.

The average 1989 communications operating budget for sites with separate capital budgets was $7.4 million. For companies with no separate capital budgets, the average budget was $5.7 million. It may appear counterintuitive that companies with separate capital budgets reported higher operating expenses than those that lumped capital equipment expenses in with operating expenses. However, the former were larger companies that also had much larger overall expenditures. They averaged 8,100 employees in total, while companies that combined operating and capital expenses in a single figure averaged 5,550 employees.

Budget growth plans are shown below by type of company.

Communications budget growth

	1988 to 1989 actual	1989 to 1990 requested
Firms with separate capital budgets	5.4%	8.6%
Firms without separate capital budgets	8.6%	13.5%

SOURCE: TFS, INC., WESTFORD, MASS.

On average, communications budgets are growing faster than inflation, which is running at about 5% so far this year. The budgets are also growing faster than overall company spending. The average communications operating budget for 1989 increased 7%, and managers are looking for a boost next year of more than 11%.

These requested budget increases are much higher than the actual increase over 1988 and may in part reflect managers' tendency to have overly optimistic expectations. Some of these requests will likely be cut by senior management. TFS COMM/SURV predicts that overall spending on communications will be up 9% in 1990 over 1989. However, when separate capital budgets are factored in with operating budgets, the growth for 1990 will be even higher, at 11%.

Also, depending on how amortization schedules are handled, capital budgets can have a roller coaster effect on budgeting year to year. For example, a new private branch exchange may have a seven-year life yet be amortized over a longer period. It is that amortization that is often allocated into a user's operating budget. The difficulty for many users is that the amortization schedules often don't coincide with the actual useful life of communications products since technology changes so rapidly.

The reason many users face this problem is because corporate powers don't like to upgrade major products if the existing gear isn't fully depreciated. Network managers, therefore, are placed in a difficult predicament: They must determine how to satisfy the organizational demands for new technology and, at the same time, keep the chief financial officer satisfied that the useful life of the existing equipment has been exhausted.

The capital spending lined up this way:

Capital spending

PBXs:	29%
Network management:	16%
T-1 gear:	14%
Modems and multiplexers:	12%
Computer front ends:	12%
All others:	17%
Total:	100%

TFS, INC., WESTFORD, MASS.

Who spends where?

Spending varies by region. As you might expect, the heaviest spending takes place in the more industrial and populated areas of the country, as the map on this page shows. User companies were divided by regional Bell holding company regions. The mid-Atlantic area, which includes the federal government's Washington, D.C. sites, leads the pack with average operating expenses of $10.8 million. That region is followed by California at $9.1 million and the Northeast at $8.08 million. Out in the desert and mountain areas, average budget numbers fall to $5.58 million, reflecting smaller average company sizes. The Southwestern Bell Corp. region reported the lowest average budget — $1.9 million.

The traffic mix by industry also turned up interesting variations (see Figure 3 on page 40). The highest voice-to-data communications budget ratios show up in agriculture/mining, health care and education. The higher proportion of voice use in health care facilities — 64.9% vs. 31.2% for data — could be due to the fact that health care companies handle most of their data communications within single facilities and, therefore, do not need to transfer much data off-site.

The reverse is apparently true in the business and professional services category, which includes accounting, legal, real estate and consulting firms. Their high ratio of data communications to voice — 52.9% to 42.1% — could be explained by the fact that these companies are more likely to engage a service bureau for data processing and thus have large data communications needs.

Government voice budgets may be artificially depressed because of the Federal Telecommunications System and other government private voice networks. Government users do not see voice expenses coming out of their operations budget because these networks are financed out of other budgets.

The insurance industry, which has invested heavily in computers, has about the same voice-to-data ratio (59.5% to 38.7%) as manufacturing. A previous TFS COMM/SURV study indicated that insurance companies are still living predominantly in the batch processing world and represent a major opportunity for networking.

The staff split

For companies in which communications is a subset of MIS/DP, communications staffing is generally about 30% of the total information systems staff and is split fairly evenly between voice and data communications.

Let's dwell on this last point a bit.

Those of you familiar with studies published over the years by various research and personnel management firms covering MIS spending will know that staffing consistently eats up 40% of MIS budgets. In the communications realm, with line charges subtracted, that figure is still under 30%.

The point? That communications departments have always had leaner staffs than MIS departments.

This makes some sense, given the amount of network design, traffic engineering and system operations carried on by the telephone companies and considering the need for programmers on the MIS side. But even if those factors are put aside, there is plenty of anecdotal evidence that MIS departments are *still* more richly staffed than communications departments.

This is likely to change, however. As networks become more critical to businesses, staffing levels will increase, both in numbers and status. This is in line with other TFS COMM/SURV research that has shown steady increases in staffing of the communications function, whether that function is part of MIS or not.

With data communications spending now rivaling voice spending in communications budgets — the actual proportion is 56% for voice and 42% for data — an ever-increasing portion of MIS budgets represents communications expenses.

As this trend indicates, the communications function is quickly becoming a more important part of the information systems equation.

On average, communications budgets are growing faster than inflation, which is running at about 5% so far this year.

▲▲▲

In fact, just as the network is becoming the solution — to paraphrase an advertising slogan — networking is becoming the information systems management function.

In spite of the increased importance of networking, the communications manager's persistent *perception* is that companies spend vastly more on MIS than on communications. The survey asked managers the question, "For every dollar your

(continued on page 40)

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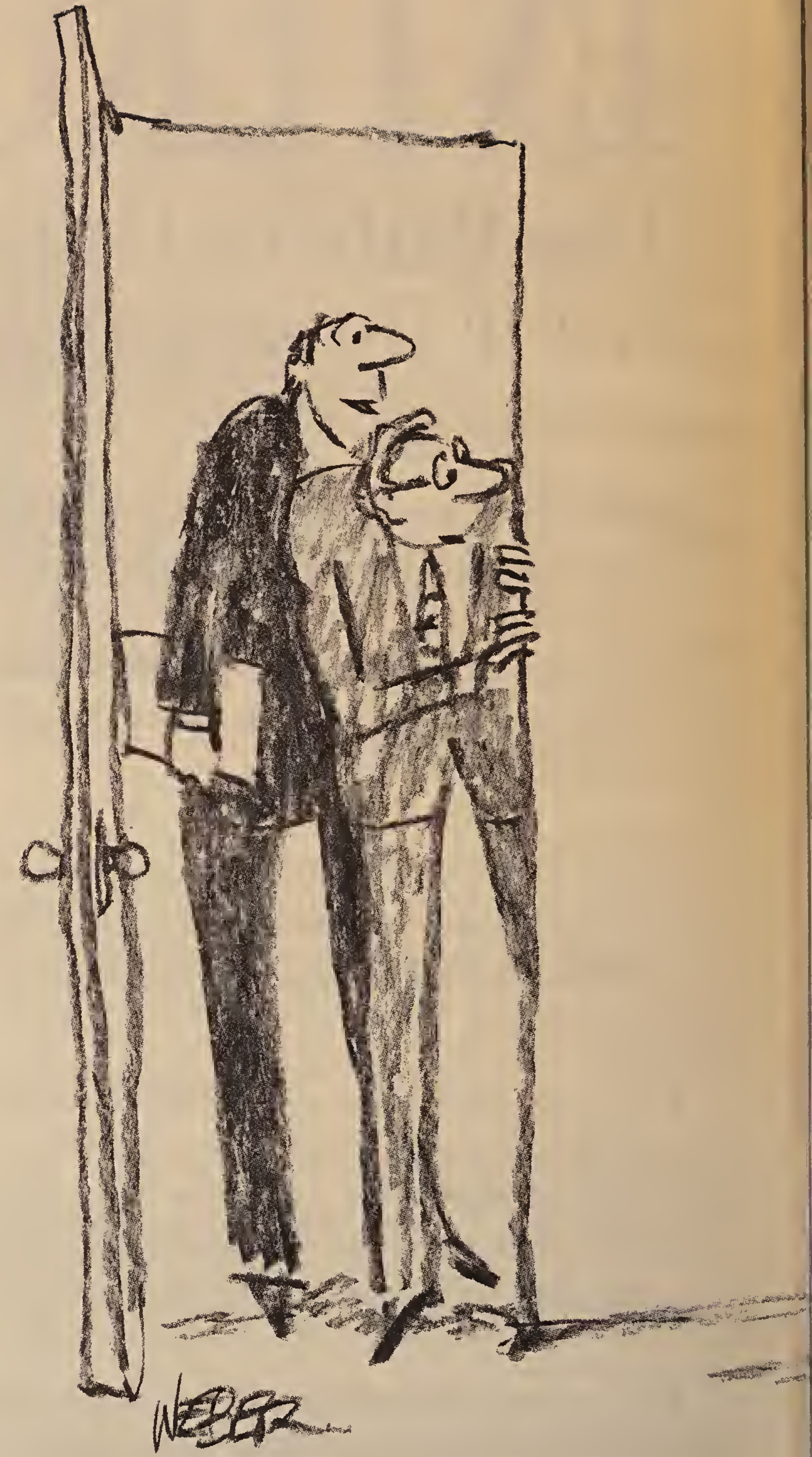

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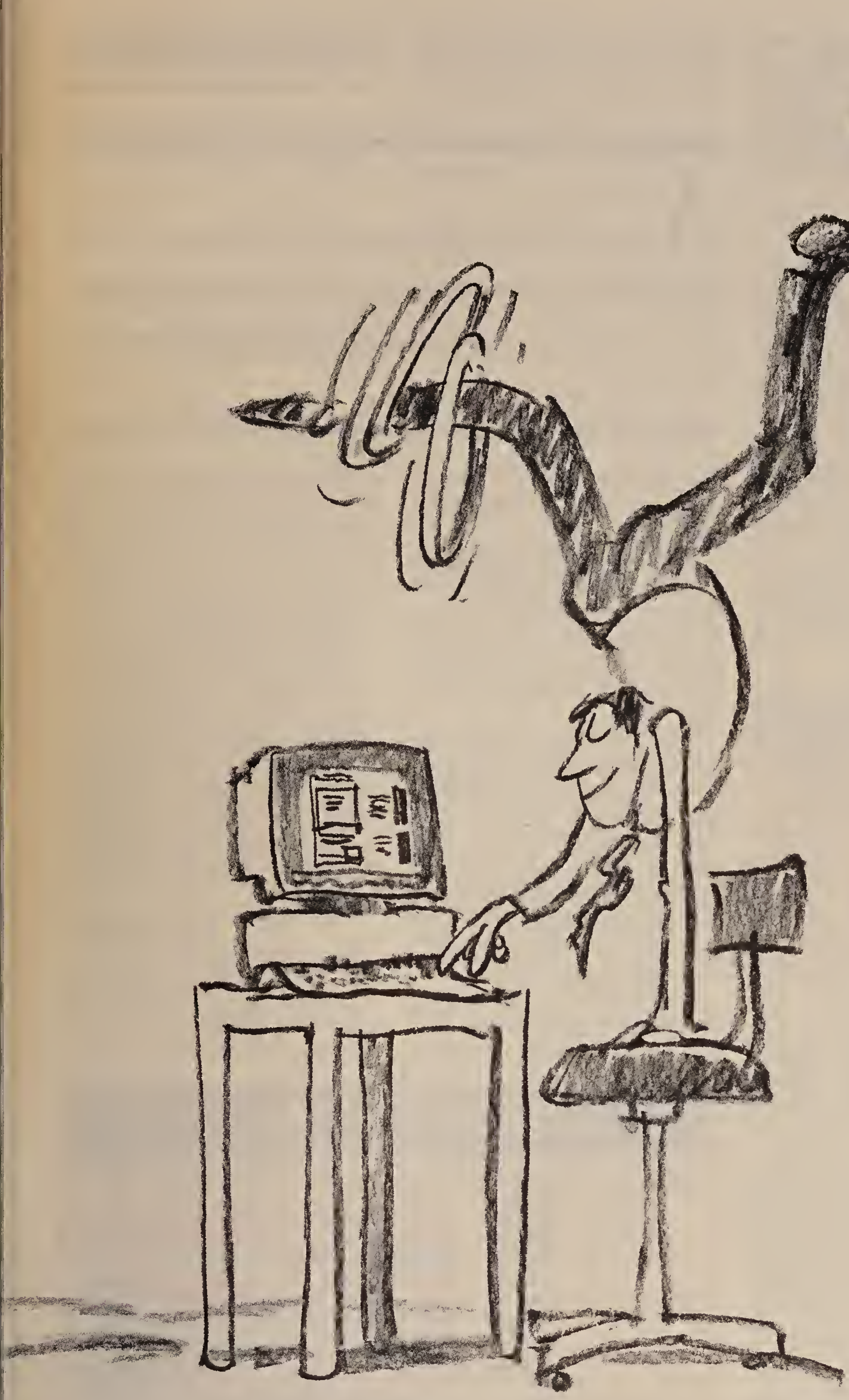

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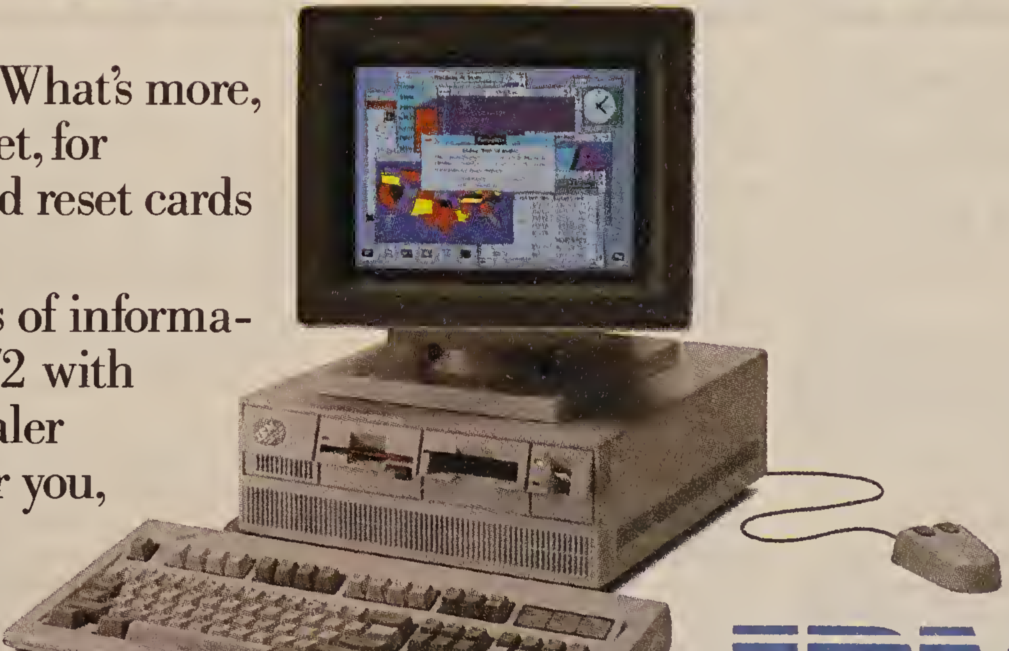

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Survey methodology

The 1989 *Network World*/TFS, Inc. budget study was based on 424 usable responses from a randomly selected sample of 1,870 communications managers, yielding a net response of 23%. Of the sample, 1,300 names were pulled from *Network World's* subscriber list and 600 names came from TFS' own internal data base.

Sites were chosen from many industries and regions to gain a statistically representative sampling. Organizational size parameters were used to ensure that larger sites were chosen, which would offer insight into where the leading-edge users are going with respect to budgeting and staffing within the communications environment.

The questions

The survey included questions on staffing, reporting structures and relationships with other information systems as well as intracompany issues — areas in which *Network World* readers clearly have a major interest.

The information was collected using disk-based, rather than paper-based, survey questionnaires, a technique that TFS has been successfully using for industrial, high-technology research. Respondents input their own data on 5¼-in. floppy disks, which were preprogrammed and mailed by TFS. A $1 monetary incentive was provided with each survey, along with a postage-paid TFS disk mailer.

All respondents remained anonymous. The average respondent spent almost 30 minutes on the survey, providing some 70 data points of information on their company's communications spending and organizational structure.

Therefore, readers contributed, in total, almost two man-months of time to the project. *Network World* and TFS are extremely grateful to those who participated.

— *Barry Gilbert*

(continued from page 36)

organization spends on communications, how many dollars do you feel it spends on MIS/DP?" The median figure was $5, and the average was $100. Some respondents gave very large amounts. However, in another question, the survey asked for hard figures on the MIS/DP budget. The actual average MIS/DP operating budget was $11.3 million in comparison to $7.4 million for communications. The conclusion is that communications managers still feel slighted in relation to MIS spending, and some animosity exists between the two functions.

Communications managers still feel slighted in relation to MIS spending, and animosity exists between the two.

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Who's paying for what?

Getting a handle on budgets is never easy. Some companies centralize budgets, some parcel them out, and some have a little here and a little there. Since the intent of this survey was to provide benchmarks, the goal was to monitor who had what budget, how those budgets are allocated and how fast those budgets would grow.

Almost half of the respondents submitted their company's total U.S. communications spending, while another third gave us only site budgets; an eighth gave us worldwide budgets. The survey was actually designed to let the respondents indicate how their budget was reported within their own organization rather than attempt to apportion it into prescribed survey buckets.

There is a growing amount of end-user spending on communications: 28% of the respondents reported that other departments have communications budgets. This fits in with the scenario that says companies are generally decentralizing their information systems despite the fact that the communications function has steadily grown since divestiture.

Almost two thirds of the respondents (63%) reported that other departments didn't have their own communications budgets. Yet 72% of companies have some chargeback scheme. More specifically, 27% have full chargeback systems, and 45% have partial chargeback systems. The number of companies doing some form of chargeback has grown in recent years as better systems have evolved. TFS COMM/SURV expects to see this figure creep even higher as more sophisticated monitoring and control systems are implemented by communications managers, allowing them to determine communications usage and bill back the appropriate parties.

The implications of the trend toward more end-user spending on communications is significant. As end users become more aware of how much they are spending on communications, they will demand more efficient and, initially, more costly communications applications to help manage their areas.

Who's the boss?

Communications departments are gaining clout. More than 50% of the respondents said their department's top executive was either a director or company vice-president. Organizations now recognize their networks' importance as a strategic tool and are entrusting their management to more senior-level personnel. The days of reporting to facilities management are over.

Here's the breakdown by title, showing the senior-most member of the communications department:

Who's the boss?

The most senior member of the communications department, by title, was:

Vice-president	20%
Director	32%
Manager	38%
Supervisor	5%
Other	5%
Total ·	100%

SOURCE: TFS, INC., WESTFORD, MASS.

What's it all mean?

Let's step back for a moment from examining the cellular structure of the tea leaves and see how they lay in the cup — what's behind the numbers.

Putting the budget data into the context of a six-year history of conducting these surveys, modeling the data and coupling it with the hundreds of man-years TFS COMM/SURV has spent examining the communications and computing industries, one can come to a few conclusions:

Communications departments are still lean. With the need for cross-training in voice and data communications growing as more networks start to accommodate both areas, personnel shortages are likely to become a bottleneck, as other TFS COMM/SURV surveys have shown.

Compounding these demands even further is the emergence of video communications. Although video currently only accounts for a measly percentage of the average traffic, it will begin to gain momentum and become significant in the early to mid-1990s.

The survey shows video allocations growing from 2.6% of the 1988 budget to 2.9% in 1989 and 3.4% in 1990. While that is a small slice of the pie, it is a high rate of growth, and TFS COMM/SURV expects to see video usage grow much faster in the '90s.

With communications becoming a more important component of the total information processing activity, top managers' titles will likely migrate toward vice-president. Also, as more companies appoint chief information officers (CIO) with responsibility for both MIS and communications (one TFS COMM/SURV study shows that 10% of companies now have CIOs), more of these top executives will be coming from the communications side.

As end users become more aware of how much they are spending on communications, they will demand more efficient applications.

▲▲▲

TFS COMM/SURV expects that overall, U.S. communications spending will increase 9% in 1990 from 1989, slightly down from what managers are forecasting — or hoping for — today.

TFS COMM/SURV expects capital budget forecasts — which are up a whopping 18% in the reporting respondent sample — to show around 11% growth from 1989 to 1990 for the U.S. The economy seems to be remaining stable, and competitive pressures will keep U.S. companies investing in communications.

The challenge of the '90s will be letting end users manage their own computing and communications resources while maintaining central control of data structures, network architectures and information systems philosophy. As end users spend more and more money, they will want more input. The oversight of networks is still handled by a central group, but that group is starting to listen to their customers more.

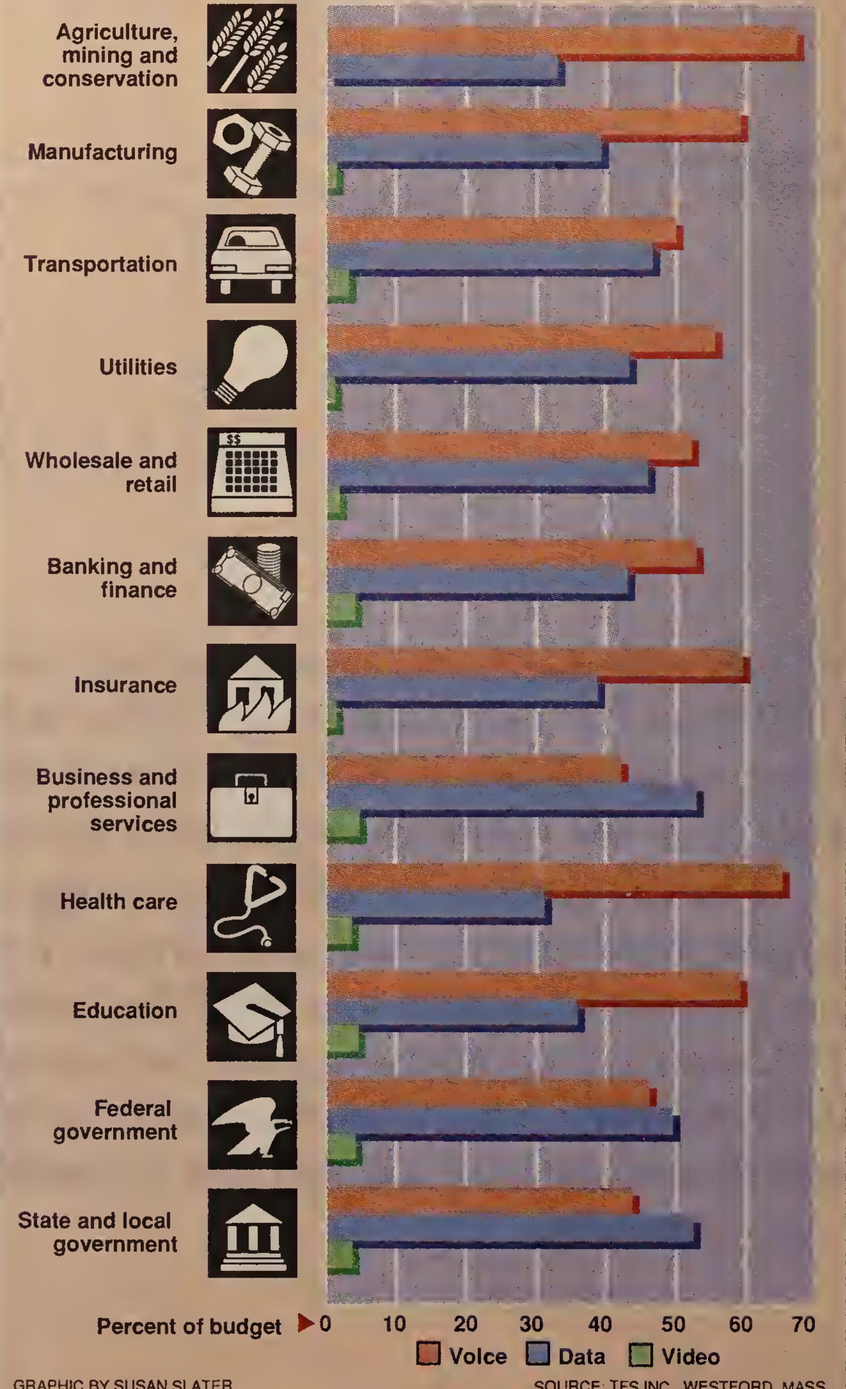
There is a final prediction — one related to the degree of cooperation TFS COMM/SURV received in conducting this survey: *Network World* readers will continue to be proactive forces on behalf of their companies' efforts to wield communications technology to their best competitive advantage.

The time is quickly passing when communications is seen only as a necessary expense of conducting business and not a major contributor to revenue and margin growth. ◼

Traffic mix by industry

Figure 3

Percentage of budget allocated to voice, data and video for 1989.



GRAPHIC BY SUSAN SLATER

SOURCE: TFS INC., WESTFORD, MASS.

Apocalypse now?

continued from page 30

lished since 1963 to deal with telecommunications emergencies and preparedness, Contel's McDonald points out that no single federal agency has final responsibility — much less a staff or budget — to coordinate emergency preparedness effectively or say how the national and regional switched networks ought to be protected.

"The government isn't responding adequately," he says. "There is no government agency that is both sufficiently concerned about the problem and has the power to do anything about it."

Concern about telecommunications vulnerability has apparently increased over the years, however. Since 1963, when President Kennedy established the NCS in response to shortcomings in emergency communications identified during the Cuban missile crisis, responsibilities for national emergency telecommunications have been shifted among various federal groups, mostly by executive order, not by congressional legislation.

In 1970, for example, President Nixon used an executive order to form the Office of Telecommunications Policy in the Executive Office. This group was responsible for a centralized national telecommunications policy. President Carter, however, abolished the policy office in 1978 to reduce the size of the Executive Office and correct alleged misuse of power.

In 1979, some telecommunications responsibility was shifted to the newly created Federal Emergency Management Agency (FEMA), with the president maintaining coordination responsibility for telecommunications mobilization. In the '80s, responsibility for implementation of telecommunications preparedness has, in part, been spread among the Office of Science and Technology Policy, the National Security Council, the Department of Commerce and the Defense Communications Agency.

"National emergency telecommunications are a hodgepodge of laws, executive orders, history, personalities and compromises," wrote U.S. Air Force Col. Robert Reinman, a former senior fellow of the National Defense University, in a monograph entitled, "National Emergency Telecommunications Policy: Who's in Charge?" Reinman wrote, "Politics has caused the disbanding of an organization that had the authority to provide [a] national telecommunications policy."

One former official in the NCS reports that since the Reagan administration, government interest in emergency preparedness has exploded, resulting in the creation of several new security groups. Among these are the National Security Decision Directives-97 Steering Group, which includes members from the NCS, National Security Council, Office of Science and Technology Policy, and Office of Management and Budget. Reporting to the steering group is the Office of the Manager of the National Communications System, which is run by the director of the Defense Communications Agency, Lt. Gen. John Myers.

"What we have in the U.S. is a committee, which hasn't been chartered by Congress, that worries about [telecommunications] emergencies," says the official, citing the National Communications System, whose staff works under the umbrella of the Defense Communications Agency.

He adds that NCS, in turn, works in tandem with yet another committee — the National Security Telecommunications Advisory Committee, an industry group created by President Reagan and composed of 30 people who are the chief executive officers and presidents of major telecommunications corporations. The purpose of the committee is to advise and assist the president on technical and policy issues affecting national emergency telecommunications.

"NCS operates from the perspective that the government ought to be worried about [emergencies], but the government isn't worrying about it effectively enough," the official says. "The industry committees just keep going because industry people know the problems and know what's supposed to get done."

Impact of divestiture

"My personal view is that the nationwide telecommunications structure is sufficiently resilient to function through any emergency I can think of short of nuclear war," says retired Air Force Lt. Gen. Lee Paschall, who sat on three successive National Academy of Sciences/National Academy of Engineering committees on national security and emergency preparedness.

However, Paschall does not rule out major regional isolations caused by natural disasters such as the eruptions of Mt. St. Helens or a major earthquake. "Short of nuclear war, the vulnerabilities primarily seem to be local areas," he says. "If I were to look at the thing most likely to cause problems, it would be electrical power generation. I don't think the nation's electrical power grid is as well protected and backed up as the telecom system."

Paschall cautions, however, that the impact of divestiture has had negative effects on the integration and interoperability of the network and its ability to cope with extraordinary disaster as a whole. He cited the consolidation of transmission and switching, the advent of common channel signaling and particularly customized data bases — such as enhanced 800 service data bases that are integrated with each vendor's Signaling System 7 STP equipment — as potential "chinks" in the national telecommunications armor.

"What we've seen is an organizational fragmentation by divestiture," Paschall says, "and, at the same time, the consolidation of transmission and switching caused by technological change. The net result is systems operate more independently of one another and there are fewer facilities; this makes it more difficult to restore [service] and makes the loss of facilities even more important."

Paschall said he believes that despite the growing number of communications networks, "The key problem is to make sure they can interoperate in the event of an emergency." Carriers such as AT&T, MCI Communications Corp. and US Sprint Communications Co. can interoperate, he asserts, "but they don't do so easily. In terms of their signaling and supervision, they don't at all.

"When you talk about causing AT&T's signal transfer points to be backed up by [US] Sprint or MCI STPs, there's a lot of proprietary information in each of those customized data bases [associated with the signaling system]," Paschall says. "Everybody's operating from the same standard but because of the competitive nature of telecom, you've got the potential for divulging proprietary data."

Paschall says he wonders whether the major competitors could ever be induced to cooperate on that level. He says he has recommended that NCS examine the problem. "Whether it's politically feasible is another matter entirely," he adds.

Other officials are wondering about vendor interoperability as well. "As a country, we're not ready to cope with crisis," says the former official from NCS who asked not to be identified. "The way we move information is fundamental to how our country is run, but the system is full of vulnerability. If something goes wrong, we're in trouble."

Links keep exchanges honest

continued from page 19

mated data input terminal (AUDIT) system that the exchanges are developing will not only improve enforcement of trading rules but could cost many exchange employees their jobs.

Currently, futures traders at the exchanges record transactions primarily at the end of the day by giving paper records to data entry personnel, who key them into exchange computer systems.

Some critics say that type of paper record keeping makes it relatively easy for traders to report misleading execution times and prices for trades, skimming profits from their customers.

Take a byte outta crime

Some of the 46 indictments arising to date from a federal investigation of trading practices in the Chicago exchanges stemmed from traders reporting inaccurate times and prices for transactions.

AUDIT, according to the Chicago Board of Trade spokesman, would make reporting misleading execution times and prices nearly impossible. To execute a trade, traders would have to enter it into their AUDIT terminals.

All relevant price and execution-time information would then be captured by the exchanges' computer systems, making fraud and data manipulation extremely difficult.

AUDIT is also likely to lead to the elimination of two types of jobs at the exchanges, the spokesman said.

Reporters, who monitor trading pits and enter market prices into exchange computers, would no longer be needed because the data would be captured directly from the traders via the AUDIT system.

Runners, who carry messages for buy and sell orders between traders and their brokerage firms, would probably not be needed as well. This is because AUDIT will contain a message system that would let brokerage companies route buy and sell orders directly to their traders via the AUDIT network.

The spokesman said these two positions combined represent about 200 jobs at the Chicago Board of Trade.

Other proponents

In addition to the futures exchanges, both the New York Stock Exchange (NYSE) and the American Stock Exchange (ASE) are considering giving traders handheld terminals and using spread-spectrum radio technology to network these devices with exchange computer systems.

With spread-spectrum technology, data transmissions are sent and received over a constantly changing sequence of channels, making it possible for numerous transmissions to take place in the same area without interference.

Officials of the stock exchanges said that, if implemented, wireless networks could make it easier and faster to execute transactions on the trading floor. Neither exchange expects major employee dislocation, primarily because they work differently than the Chicago exchanges. Neither the NYSE or ASE has reporters, for instance.

According to Nynex's Waldhuter, several other organizations are considering using spread-spectrum radio technology.

For example, Waldhuter said Nynex is working with hospitals that may employ the technology to signal nurses when vital life support systems fail.

Waldhuter said more applications will develop as spread-spectrum radio technology matures. The Federal Communications Commission only began granting spread-spectrum radio licenses in the early 1980s, he said.

"It will take some time, but eventually this technology will proliferate throughout all kinds of organizations," Waldhuter said.

Letters

continued from page 25

tem capability. Since the majority of gateway vendors interface their hardware with network operating systems through a NETBIOS interface, we fail to see how compatibility with "current versions" of 3+ can be called into question.

It is true that an early version of 3+ — shipped prior to 1987 and with very limited market penetration — used 3Com-developed MINDS driver interfaces instead of NETBIOS interfaces. Gateway vendors that chose not to adapt their drivers to this proprietary product were indeed unable to interface with it.

Please note though that there are many non-3Com operating systems being sold today that are not fully NETBIOS-compatible and that are difficult, if not impossible, to interface with gateways.

To single out 3+ in such a high-profile manner was a distortion both of the facts and the way in which the sentence was used within the context of the article itself.

David Abramson
Corporate public
relations manager
3Com Corp.
Santa Clara, Calif.

Author's reply: The intent of my comment was to warn people that the current operating system release installed at their locations may not be compatible with the gateways they are considering.

The key words here are "current version installed," not the current release the vendor now offers. Incidentally, I did not mean to imply that 3+ is the only product in question. It was mentioned because drivers like MINDS may still be out there.

The IB/3 was omitted because 3Com submitted that product under the classification of a local net bridge and, therefore, it was listed as such in our July 10 issue.

I sent the request for information on 3Com's gateway products at the same time as the solicitation for router information. I received no response for gateways.

John Hunter
President
TMS Corp.
Wayne, Pa.

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DBU-3R/M	Digital Dial Back-Up Card	795	**613**
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DC201CR/M	2400 Sync Modem Card	795	**595**
DC2030	56kbs Local Data Set	850	**550**
DC208B/A	4800bps Sync, PL, DDD Mdm	1,345	**860**
DC208B/A R/M	4800bps Rack Mount Modem	1,255	**850**
DC224 R/M	2400bps Rack Mount Modem	495	**316**
DC296 R/M	V.32 Rack Mount Modem	1,725	**1,101**
DC4800	4800bps Sync, PL Modem	1,145	**730**
DC500/56K-A	56kbps DSU/CSU W/RS-422	795	**507**
DC500A R/M	9600bps DSU card	695	**445**
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DT202	Desktop 202 Modem	400	**242**
DT208	Desktop 208 Modem	1,095	**730**
DT9600	Desktop 9600 Modem	1,095	**795**
GSU500A	Data/Channel Service Unit	695	**459**
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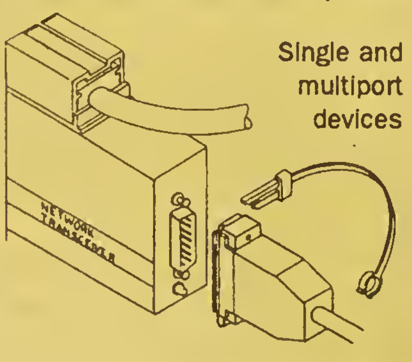

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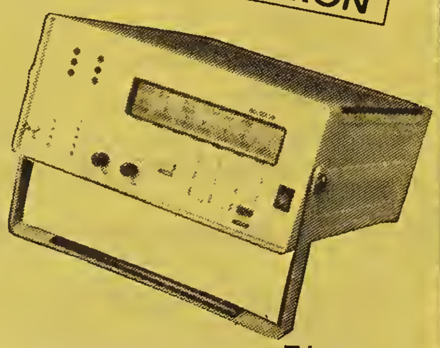

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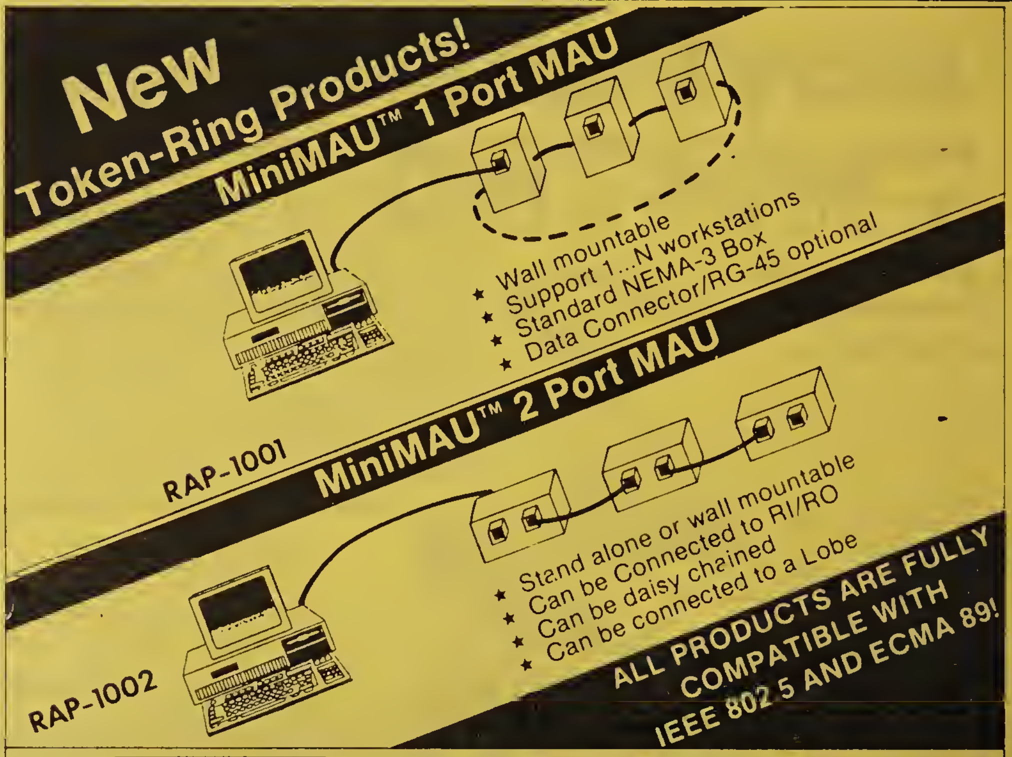

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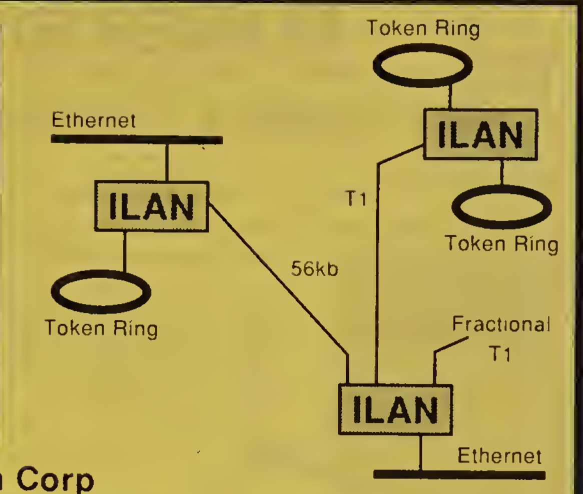

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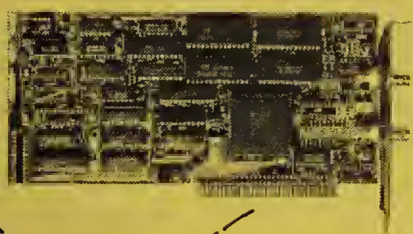

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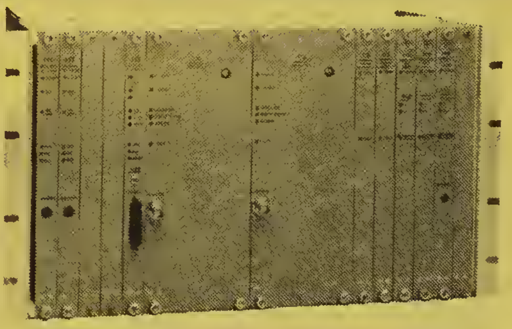

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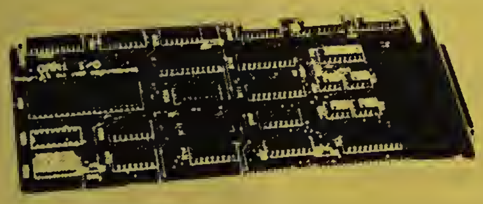

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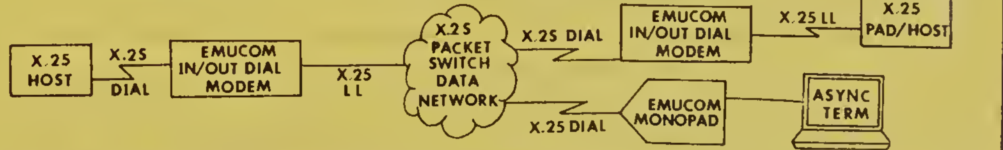

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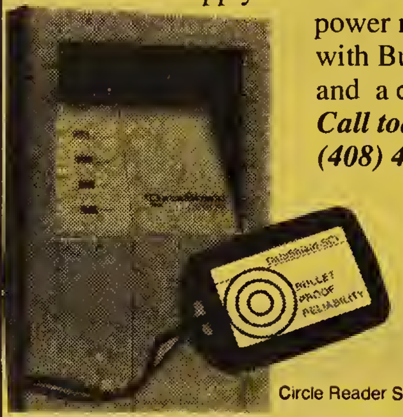

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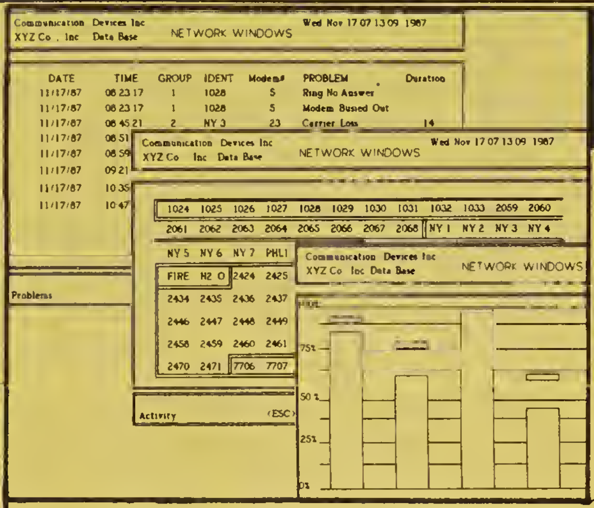

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Communication Devices Inc                        Wed Nov 17 07 13 09 1987
XYZ Co . Inc   Data Base     NETWORK WINDOWS

   DATE       TIME     GROUP  IDENT  Modem#  PROBLEM            Duration
 11/17/87   08 23 17     1    1028     5     Ring No Answer
 11/17/87   08 23 17     1    1028     5     Modem Bused Out
 11/17/87   08 45 21     2    NY 3    23     Carrier Loss          14
 11/17/87   08 51
 11/17/87   08 59
 11/17/87   09 21
 11/17/87   10 35
 11/17/87   10 47

Problems

Communication Devices Inc                        Wed Nov 17 07 13 09 1987
XYZ Co  Inc  Data Base       NETWORK WINDOWS

 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 2059 2060
 2061 2062 2063 2064 2065 2066 2067 2068 NY 1 NY 2 NY 3 NY 4
 NY 5 NY 6 NY 7 PHL1
 FIRE H2 O 2424 2425
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 2446 2447 2448 2449
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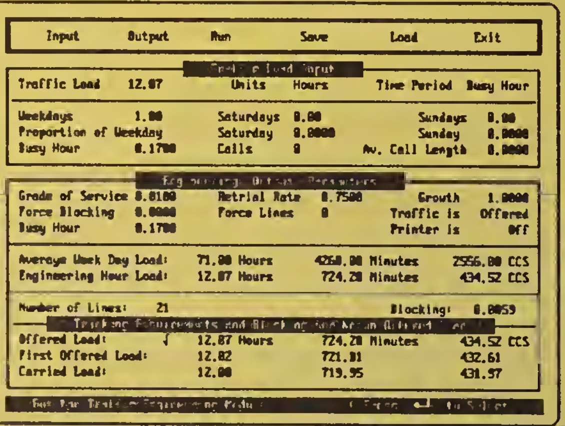

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   Input      Output     Run        Save       Load       Exit

Traffic Load    12.07        Units    Hours      Time Period  Busy Hour

Weekdays          1.00       Saturdays 0.00          Sundays    0.00
Proportion of Weekday        Saturday  0.0000        Sunday     0.0000
Busy Hour         0.1700     Calls     0       Av. Call Length  0.0000

Grade of Service 0.0100      Retrial Rate  0.7500    Growth     1.0000
Force Blocking   0.0000      Force Lines   0         Traffic is Offered
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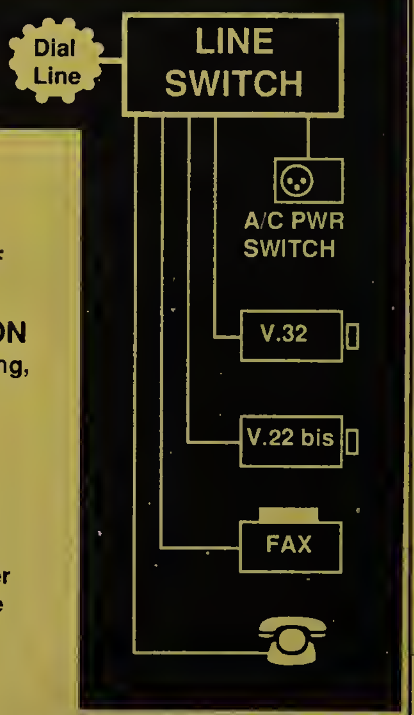

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Mac nets get slew of new E-mail functions

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cess PROFS; Western Union Corp.'s Easylink; Telemail from Telenet Communications Corp., a subsidiary of US Sprint Communications Co.; and E-mail systems that support the Message Handling System store-and-forward mechanism developed by Action Technologies, Inc., based in Emeryville, Calif.

The cc:Mail product costs $695 for 25 mailboxes and $595 for each additional 100 users.

CE Software, Inc., based in Des Moines, Iowa, has been shipping its QuickMail 2.0 for the Macintosh since March but this month, it will begin shipping a DOS version of QuickMail that supports E-mail exchange between users on DOS-based nets and AppleTalk nets through a Macintosh server.

The company is also working on the QM-Professional Gateway, which provides two-way E-mail links between QuickMail and PROFS. The company recently announced QM-Link Gateway, a software package that establishes bidirectional links between Apple's AppleLink mail network and QuickMail. Both gateways will ship in the fourth quarter.

Server software for QuickMail 2.0 is included in the base price of $269.95 for five Macintosh nodes. A 10-user Macintosh package is available for $399.95.

Third-party vendors are busy building gateways to link AppleTalk networks to other E-mail nets. Several will ship as early as this month.

Pacer Software of La Jolla, Calif., and Alisa Systems, Inc. of Pasadena, Calif., later this month will ship gateways for Microsoft Mail and QuickMail that establish links to PROFS, VMSMail and All-In-1, as well as E-mail services supporting the X.400 electronic messaging standard.

The Alisa Systems gateway, called AlisaMail, will support both Microsoft Mail and QuickMail. By contrast, the Pacer Post gateway will support only Microsoft Mail. A spokesman for Pacer Software said his company may eventually develop a QuickMail gateway.

StarNine Technologies, Inc. in Berkeley, Calif., is developing the Mail*Link gateway for Microsoft Mail to communicate with networks running the Simple Mail Transfer Protocol (SMTP), an E-mail protocol for Transmission Control Protocol/Internet Protocol-based networks. The company has been shipping a similar gateway for QuickMail since July.

Mail*Link will support connections to Unix- and Xenix-based E-mail systems, PROFS, VMSMail, All-In-1, Data General Corp.'s AOS/VS Mail and Hewlett-Packard Co.'s DeskMate, as well as to networks using TCP/IP.

TOPS' InBox will incorporate Mail*Link SMTP software to link with Unix E-mail and PROFS.

Soft-Switch, Inc., based in Wayne, Pa., expects to ship its SNADS Gateway for Microsoft Mail later this year. The gateway establishes access to DISOSS, PROFS, All-In-1, Wang Office, HP Desk and the E-mail systems supporting the X.400 standard. Soft-Switch is also working on a gateway between InBox and PROFS. ◻

Banyan offers entry-level version of VINES

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The VINES/386 Team announcement comes a week after 3Com introduced a 10-user version of 3+Open and seems to signify increasing competition in the low end of the local network market ("3Com adds 10-user version of 3+Open LAN Manager," *NW,* Aug. 28). It also coincides with the initial release of NetWare 386, which Novell began shipping last week.

Until the release of NetWare 386, Banyan was the only company among the major network vendors that had a net operating system designed to exploit the Intel Corp. 80386 microprocessor. The existing generation of NetWare, as well as 3+Open and other versions of Microsoft Corp.'s LAN Manager, were designed for Intel's 80286 chip.

However, Novell is aiming NetWare 386 strictly at the high end of the market; the product supports up to 250 users per server and is priced at $7,995. Thus, VINES/386 Team is the only major entry-level network operating system optimized for the 80386.

VINES/386 Team's other distinguishing characteristic, StreetTalk, is a distributed naming system that provides a unique name to every user and shared resource — including disk drives, printers, data bases, gateways and applications — on an enterprisewide network.

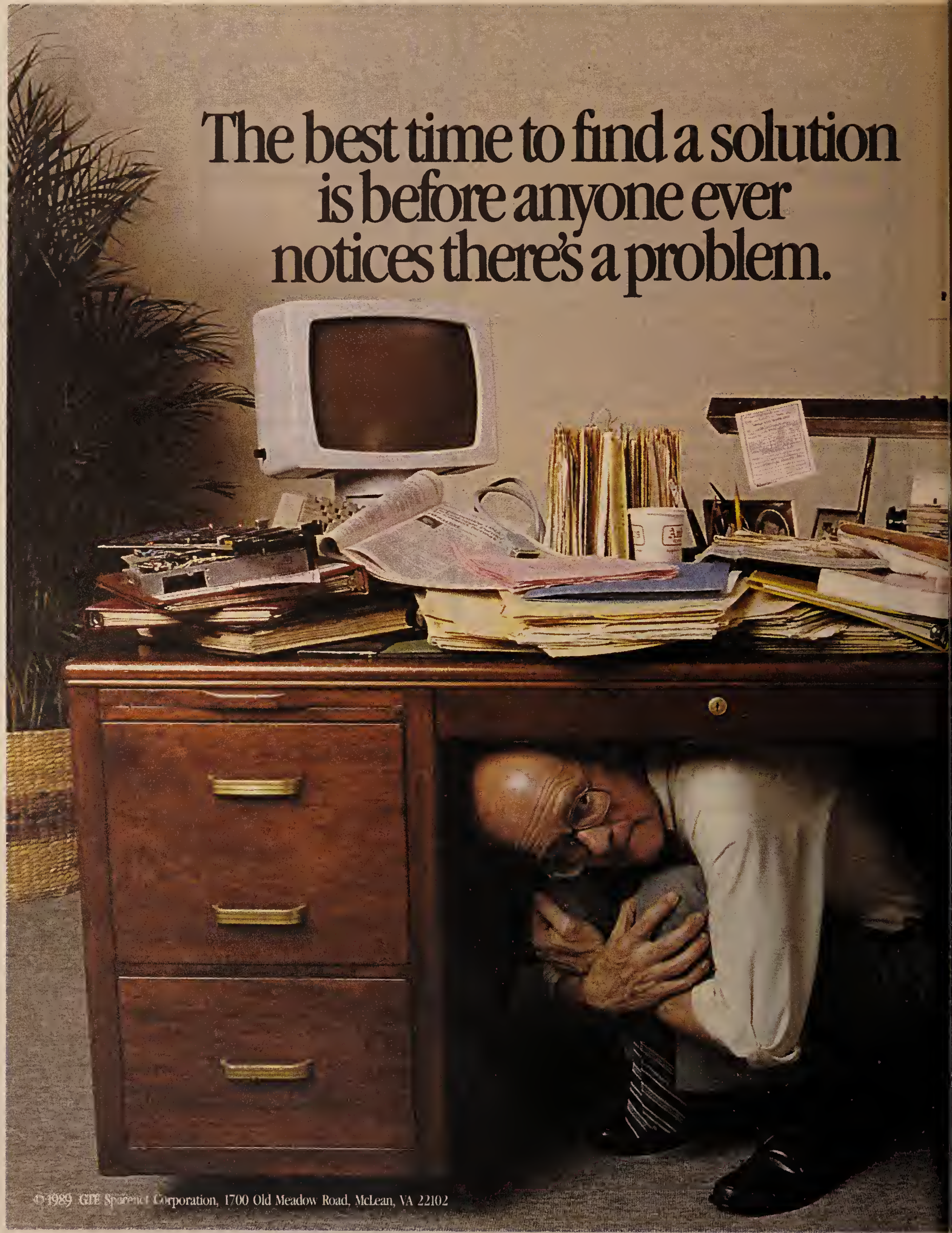
With a facility like StreetTalk, users need only know a particular resource's name, not its location on the corporate network, to access it. Similarly, user access rights are defined in terms of resource names, which makes it easier for network administrators to move both users and resources from one local segment to another in an enterprisewide network.

Banyan said VINES/386 Team "is identical to and completely compatible with VINES/386" with one exception: It does not support server-to-server communications over a local network.

Users who want to bridge adjacent local nets into one big internetwork will have to use the full-blown VINES/386 product.

Beginning Jan. 1, 1990, there will be an upgrade discount for those work groups that started with the 10-user version and need to upgrade to VINES/386. The discount will be equal to the price of VINES/386 Team, minus the price of any promotional packages included at no cost.

VINES/386 Team currently runs on 80386-based microcomputers incorporating IBM's AT bus architecture. Banyan said support of IBM's Micro Channel Architecture will be added "at a later date." ◻



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User hustles to salvage DNS network

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Aug. 28). Those nodes support directly attached microcomputers that replaced Wang Laboratories, Inc. minicomputers and Wang terminals.

"We'll finish installing DNS nodes so we don't have a network that is half old and half new," said Armin Gumerman, Northwestern Mutual Life's director of information systems. Northwestern was surprised to hear of the demise of the DNS but praised Northern Telecom for offering to support the product until the insurer decides how to proceed, he added.

The remaining DNS nodes should be installed by the end of October, Gumerman said. "Then we're going to regroup to see where we go from here."

The insurance company's DNS-based network is replacing an existing leased-line net that links processors in more than 100 general agent offices to an Amdahl Corp. host here.

Northwestern Mutual Life's grand plan was to install a DNS node at each site capable of supporting local nets of microcomputers as well as remote microcomputers. The DNS nodes would be connected in a private X.25 packet network linking each site to Northwestern Mutual Life's data center at 19.2K bit/sec.

Gumerman said his company had also planned to use DNS to support stand-alone microcomputers in remote corporate offices. Those microcomputers are currently linked to headquarters via either 4.8K bit/sec leased lines or a public packet-switched net. Plans call for the microcomputers to be linked to the nearest DNS node via 9.6K bit/sec leased lines or a public packet net.

Northwestern Mutual Life wanted to download files and applications from the data center to DNS nodes each day. Using DNS nodes as file servers, microcomputer users would have had quicker access to customer account files and applications that aid in analyzing a customer's insurance needs. However, since the local net, file server and application server capabilities are missing from DNS, Gumerman said his firm must now decide whether to work with Northern Telecom to develop that functionality or take another approach.

The two companies are currently meeting to work out such issues. "They're going to work with us to see that we get what we expected to get," he said.

DNS was developed by Northern Telecom's Data Communications Systems division over a two-year period at a cost of $100 million. The DNS unit was intended to house interface boards supporting terminals, workstations, host computers, local nets and private branch exchanges.

Northern Telecom said DNS nodes could be linked via high-speed digital data lines, X.25 packet lines or T-1 facilities. Each DNS node could also be managed and configured via a workstation attached to a central site DNS. "It was the integrated nature of the product that was attractive to us," Gumerman said.

Each DNS costs between $50,000 and $90,000, depending on configuration. Gumerman declined to say how much Northwestern Mutual Life paid for its DNS nodes. Because the insurer's multiyear contract specified DNS nodes that support more than the current DNS offering does, the companies are renegotiating the sale price. Gumerman said Northern Telecom seems willing to reduce the cost of the nodes because they do not support all the features his firm had ordered.

Only one function

To date, Northwestern is only using a single DNS function. That function, linking directly attached microcomputers to a host via X.25, has been working well, Gumerman said.

One DNS beta tester shipped the product back to Northern Telecom because it could not deliver the functionality Northern Telecom promised. "Because [DNS] is so versatile and flexible, we could've been using parts of it that run well, and somebody else could have been using parts we weren't even trying," Gumerman said.

"We're very happy with the product," he added. "Our people like it, and we were disappointed [that the company discontinued it]. If we were unhappy, that would be a different situation. But we're not. The offices that have the equipment say everything is really smooth and running faster than before. But it is not doing everything that we contracted for." ☒

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Metromedia buys up ITT's long-haul units

continued from page 7

and data communications, and switched long-distance and WATS services for commercial and residential users. ITT Chernow Communications specializes in call accounting and communications services for the hospitality industry.

Metromedia Long Distance, a regional long-haul carrier, is most prominent in Texas, Florida and the New York/New Jersey areas. The carrier offers long-distance service and specialized billing packages to small and midsize commercial customers, and residential customers in those areas, she said.

According to John Kluge, president and chairman of the parent Metromedia company, the purchase makes Metromedia Long Distance "a major player" in the long-distance market.

The acquisition makes sense for ITT, a longtime player in the long-distance market that became aggressive too late in the game, and Metromedia, which needed to link its disperse regions, said Robert Self, founder of Market Dynamics, a telecommunications consulting firm in New York. "Critical mass is a critical term for Metromedia," he said. "This acquisition should give Metromedia more traffic [and let it] cut prices." ☒

US Sprint unveils ISDN plan

continued from page 1

first quarter of 1990.

In conjunction with its ISDN service announcement, US Sprint also opened to the public an ISDN testing facility it has built in Burlingame, Calif. Network engineers have been experimenting there with interconnection of ISDN and non-ISDN equipment from multiple vendors (see "US Sprint goes public with ISDN test lab," below).

Service details

US Sprint's ISDN service will be offered to customers served by all of its 268 nationwide points of presence. The service can be used to access the carrier's Ultra 800, Ultra WATS, Virtual Private Network and switched data services, according to Terry Kero, director of systems planning at US Sprint. Service will be available to users with T-1 access to US Sprint's network.

US Sprint will initially implement ISDN hardware and software on only two of its Northern Telecom, Inc. DMS 250 central office switches — one on the East Coast and one on the West Coast.

The local serving office will pass a user's Primary Rate Interface link off to the nearest ISDN-ready switch, Kero said, but the user will only be charged for T-1 access to the local switch. He said ISDN demand is expected to be low at first, so two switches should be able to support the traffic.

By way of comparison, AT&T currently supports Primary Rate Interface service from serving offices in nearly 70 cities and plans to increase the number of cities to 110 in 1990.

US Sprint ISDN will also support dynamic access to switched 56K bit/sec and so-called restricted and clear 64K bit/sec services.

▲▲▲

US Sprint will offer its initial set of ISDN features over the Primary Rate Interface link. The Primary Rate Interface specifies how a T-1 line is segmented into 23 64K bit/sec B channels for voice, data or video traffic, and one 64K bit/sec D channel for out-of-band signaling and packetized data transmission.

The Integrated Telenet Packet Data Access feature enables customers to access the packet-switching network of Telenet, US Sprint's data communications subsidiary, on a dynamic basis. Currently, Telenet's network is accessed via either dial-up or private lines.

If private-line access is used, the entire bandwidth of the link is allocated for access.

However, with the new ISDN capability, users will be able to allocate only the number of B channels actually needed for data transmissions.

Call-by-call Service Access allows customers to dynamically assign B channels for voice, data or video transmission. Currently, channels must be dedicated to only one service. This feature is similar to AT&T's Call-by-Call Service Selection.

Calling Number Identification, frequently referred to as ANI, displays on screen the telephone number of an incoming call.

The VPN PBX Interworking feature will initially support three features: calling line identification, calling party name and ring-back for busy calls.

US Sprint ISDN will also support dynamic access to switched 56K bit/sec and so-called restricted and clear 64K bit/sec services. With the restricted 64K bit/sec service, users have the full 64K bit/sec channel bandwidth available, but the circuit is subject to failure if the data stream contains a string of 15 zeros. The 64K bit/sec clear service uses a special protocol to prevent network failures due to long zero strings.

US Sprint released few details about its ISDN pricing, but Gerry Canavan, director of enabling technologies at US Sprint, said there will be a monthly recurring fee of between $200 and $400 for each D channel.

Canavan said there will also be an installation charge and individual charges for ANI and call-by-call service features, but he declined to specify any of the amounts. These charges do not include costs for the T-1 link.

Wholesaler banks on EDI

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product announcements via EDI, Super Valu hopes to reduce these mix-ups. "Basically, we want our vendors to take over the job of maintaining our [purchasing] data bases," Zwanziger said.

Super Valu began urging its suppliers to adopt EDI UCS for delivering promotion and price change announcements in 1986, when it began pilot-testing the standards. The company now exchanges such data via EDI with 15 grocery industry brokerage firms, each of which represents anywhere from 25 to 75 vendors from which Super Valu buys goods, Zwanziger said.

Super Valu is also working with one broker to test another EDI UCS for delivering information about new products and changes in existing products.

Currently, only a small percentage of all the price change, promotion and new product announcements Super Valu receives from its suppliers arrive via EDI. Zwanziger said Super Valu wants to extend its use of EDI so that nearly all of these notices arrive electronically. "EDI has the potential to change the way we do business," Zwanziger said.

US Sprint goes public with ISDN test lab

By Anita Taff
Washington Bureau Chief

BURLINGAME, Calif. — US Sprint Communications Co. last week showed off its Integrated Services Digital Network laboratory here.

The lab, which played an important role in the development of the US Sprint ISDN services announced last week, is designed for interoperability testing of ISDN equipment from multiple vendors.

Terry Kero, director of systems planning at US Sprint, said the lab will also be a key component in the development of future ISDN features to be offered by US Sprint. The lab has already been used in ISDN field trials involving US Sprint locations in Kansas City, Mo., and New York.

Kero said the lab will be opened to selected customers that want to test experimental ISDN applications for their businesses. Additionally, the lab will be used as a demonstration center, giving customers an opportunity to see working ISDN applications and to suggest new ones. That will give US Sprint the chance to gauge whether proposed services would be commercially viable, he said.

That's important for US Sprint, Kero said, because the carrier will only get paid for features people use. Manufacturers have a greater margin for error "because the equipment vendor gets paid whether [customers] use three features or 93 features," he said.

According to Kero, one of the most serious technical issues facing ISDN is the inability of switching equipment from different vendors to interoperate.

The problem, he said, is due to differences in the way various vendors have implemented ISDN standards.

For example, differences between AT&T's and Northern Telecom, Inc.'s implementation of the ISDN Primary Rate Interface make it difficult for those companies to exchange voice traffic between their switches, Kero said.

To conduct interoperability tests, the lab houses a small-scale version of US Sprint's national network linking five private branch exchanges from four vendors: Northern Telecom's SL-1 and SL-100, AT&T's System 85, Fujitsu Business Communications Systems's Focus 9600, and Siemens Information Systems, Inc.'s Saturn 2E. The network supports Common Channel Signaling System 7.

Kero said the lab has also placed orders for IBM/Rolm Systems Division's 9750 and NEC Corp.'s 2400 PBXs but noted that versions with Primary Rate Interfaces are not yet available (see "NEC to unveil enhancements for its NEAX 2400 line of switches, page 7).

The lab also includes two Northern Telecom DMS-250 central office switches, two packet switches from Telenet Communications Corp. and a range of network management and test equipment. In addition to the PBXs, a variety of ISDN customer premises equipment from a number of vendors can be tested.

Earlier this month, US Sprint brought in 100 of its top customers to view the lab and demonstrations of nine ISDN applications, which were also shown to the press last week.

The applications range from simultaneous voice and data calls and delivery of automatic number identification with data base lookup, to a multimedia ISDN transmission involving videoconferencing over two B channels and dynamic use of additional B channels to send data files and facsimile.

Most of the demonstrations involved interconnection of multivendor ISDN equipment, as well as the linkage of non-ISDN and ISDN equipment.

Kero said ISDN is finally shedding its image as the technology that would never happen partly because users are beginning to get a more realistic view of what it can offer. ISDN has been incorrectly pitched as an end in itself, but it is really just a building block in the development of intelligent networks, he said.

Users hail SNA but look ahead

continued from page 8

chical networking approach in favor of a distributed, peer-to-peer approach. In hierarchical networking, all devices must request permission from a host before accessing network resources. Peer-to-peer networking enables nodes to bypass the host and establish direct connections.

For most users, IBM 's PU 2.1 and LU 6.2 protocols, which enable an application on one device to communicate with an application on another, are becoming essential components of network strategy. So is IBM's 2-year-old Low Entry Networking (LEN) system, which is currently implemented on Application System/400 and System/3X minicomputers. LEN enables those systems to route traffic between attached devices without a front-end processor.

But there are limitations with PU 2.1 and LU 6.2, users say. Jawaid Ekram, manager of network development for Covia Corp., which operates United Air Lines, Inc.'s Apollo reservation network, said PU 2.1 and LU 6.2 do not support true peer-to-peer networking since a host must still establish a session between the terminal and the application.

And for some users, a hierarchical approach still makes sense. "Our environment is a centralized environment," said Scott Loftesness, senior vice-president of engineering for Visa USA, Inc.'s VisaNet. "So hierarchical networking is compatible with our view of the world."

VisaNet is a high-volume transaction processing net that supports authorization of purchases made with the Visa card.

Peer-to-peer networking is a major component of IBM's SAA strategy. SAA helps users and vendors build applications that can be ported from one IBM processor to another.

Users such as Sears are trying to build SAA-compliant applications that support administrative tasks. These SAA applications, which feature a common user interface, enable end users to access data or other network resources without having to learn special procedures.

For other users, SAA is not important. "We're at the high end of performance requirements so it's not clear SAA will be meaningful to Visa," Loftesness said. Supporting SAA applications means adding processing overhead that will slow the network.

In addition, Loftesness said the TPF operating system that Visa currently uses is not defined under SAA, making it difficult for Visa to build SAA applications even if it wanted to do so.

He worries that as IBM evolves SAA, it will spend the bulk of its resources enhancing elements of SNA that can be used by SAA application developers.

"There are some very large and important IBM customers in the TPF market," Loftesness said. "IBM can not glibly say that SAA is the answer to all our prayers because it's not."

T-1 mux vendors race to T-3 mart

continued from page 2

oped a T-3 product in-house, said company President Victoria Brown, but the acquisition of Broadband Telesystems will enable the company to introduce T-3 equipment by year end.

Other vendors have taken similar tacks. In May, Infotron Systems Corp. bought T-3 multiplexer maker Licom, Inc. for an undisclosed sum; and last year, Digital Communications Associates, Inc. bought Digital Transmission Systems, Inc., a Norcross, Ga.-based T-3 cross-connect start-up.

Network Equipment Technologies, Inc. (NET) — which said it will start shipping its internally developed Integrated Digital Network Exchange 90 T-3 switch in the first quarter of 1990 — plans to unveil a SONET-compliant T-3 box with the help of Tellabs, Inc. ("NET unveils T-3 mux in product blitz," *NW,* April 17).

Other players include General DataComm, Inc., which is slated to make a T-3 announcement at the Tele-Communications Association, Inc. show in San Diego later this month, and Newbridge Networks, Inc., which offers an integrated T-1/T-3 product.

NET favored

If NET stays on course, it may be able to translate its market-leading share of the T-1 business into a leading role in the T-3 arena, according to Michel Guite, a vice-president and telecommunications equipment analyst at Salomon Brothers, Inc., a New York-based investment firm.

Vertical Systems estimates that NET will capture a 22.8% share of the $581.9 million worldwide T-1 multiplexer market this year.

"This market is not so much a clear contest between technologies as it is between installed base quality," Guite said. "NET has the installed base, and its sales are strong. Those companies that do not have a big customer base will have to go back and emphasize their technology to try to get users of other vendors' products to retrofit their networks — and that could be difficult."

Mark LaRow, a senior manager at the Network Strategies practice of Ernst & Young in Fairfax, Va., agreed. "Almost nobody comes in cold and buys a T-3 network," he said. "I would expect anybody that has an existing T-1 network to buy their T-3 stuff from the same vendor."

One thing critical to all players will be the ability to provide an integrated T-1/T-3 environment, said Len Evenchik, director of data communications for the commonwealth of Massachusetts.

Evenchik recently wrapped up a request for information for a statewide T-1 backbone network that could require some T-3 equipment to support high-bandwidth applications, such as data center backup.

"The first thing I'd ask a given vendor is 'How does your T-3 offering mesh into your network management system?' " Evenchik said. He added that it is too early in the planning stages to rate the vendors' responses.

Vendors that intend to sell T-3 products to their T-1 customer base must also be ready to offer products compliant with SONET, according to Vertical Systems' Malone. SONET is an emerging international standard for sending T-3 signals over fiber optics at 51.84M bit/sec.

By the time many users are ready to buy T-3 products, the SONET standard should be finalized and in wide use, Malone said.

A number of vendors, including Timeplex, NET, Newbridge Networks and Infotron, have pledged compliance with national and international standards, including SONET. ◻

AT&T to offer virtual net

continued from page 2

State University in Detroit, said he will wait until he can examine the AT&T tariff filing before he decides whether to drop the US Sprint VPN service he now uses and opt for MAGNET.

Bursick said he has discussed the service with AT&T account representatives but is unsure what the actual filing will contain. "I have no sense right now what the realities [of AT&T's proposal] are," he said. "I have a lot of talk in my spreadsheets."

In response to the proposed AT&T plan, Bursick said US Sprint recently told the university it would reduce the school's per-minute charges and apply a 25% across-the-board discount on top of that. "I'm putting that into my spreadsheets too," he said.

"I don't want to find a bill I can't understand because it's been jury-rigged," he said. At Wayne State, he explained, the telecommunications department has no budget. It charges back all costs to the various university departments. If switching to a new network requires reprogramming the cost-allocation system, potential savings from the new network would be reduced.

Smaller colleges that have less individual bargaining power stand to benefit substantially from MAGNET, users say. George Race, telecommunications manager at Albion College — a 1,600-student college in Albion, Mich. — said the program "puts small private schools in a better position to get discounted rates."

Not having seen the AT&T proposal, he could not comment on whether it would be cost-effective for Albion to join MAGNET. "My hope is that private schools would be able to have the same opportunities and advantages as the larger schools," he said. ◻

Calendar

Sept. 18-21, New Orleans — 16th Annual North American Data General Users Group Conference. Contact: North American Data General Users Group, Suite 3150, 4807 Spicewood Springs Road, Austin, Texas 78759; (800) 877-4787.

Sept. 18-22, Orlando — COMPSAC '89. Contact: Computer Society of the IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036; (202) 371-1013.

Sept. 18-22, Sturbridge, Mass. — Fiber-optic Workshop. Contact: Fiber-optic Communications Corp., 298 New Boston Road, Sturbridge, Mass. 01566; (508) 347-8192.

Sept. 19-21, Detroit — Autotech '89. Contact: Automotive Industry Action Group, Suite 200, 26200 Lahser Road, Southfield, Mich. 48034; (313) 358-3570.

Sept. 19-21, Tarrytown, N.Y. — Network Management and Control Workshop. Contact: Center for Advanced Technology in Telecommunications, 333 Jay St., Brooklyn, N.Y. 11201; (718) 260-3600.

Sept. 20, San Francisco — Two Sides of Systems Integration: Market Trends & Buyer Perspectives. Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701; (508) 872-8200.

Sept. 20-22, Chicago — Disaster Recovery. Contact: CHI/COR Information Management, Inc., 10 South Riverside Plaza, Chicago, Ill. 60606; (312) 454-9670.

Sept. 20-22, Detroit — Broadband LAN. Contact: Magnavox CATV Systems Co., 100 Fairgrounds Drive, Manlius, N.Y. 13104; (315) 682-9105.

Sept. 21-22, Chicago — Understanding Telecommunications Technologies for Nonengineers. Contact: TeleStrategies, 1355 Beverly Road, McLean, Va. 22101; (703) 734-7050.

Sept. 27-28, New York — Personal Computing '89. Contact: International Data Group Conference Management, 20 Speen St., Framingham, Mass. 01701; (508) 879-6700.

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